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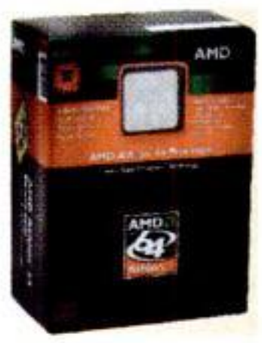

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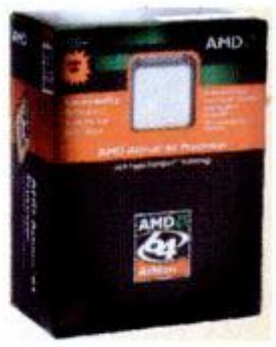

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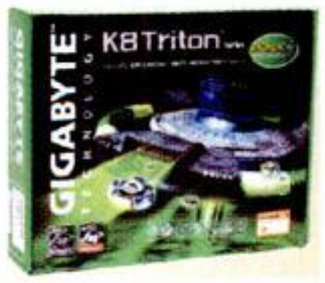

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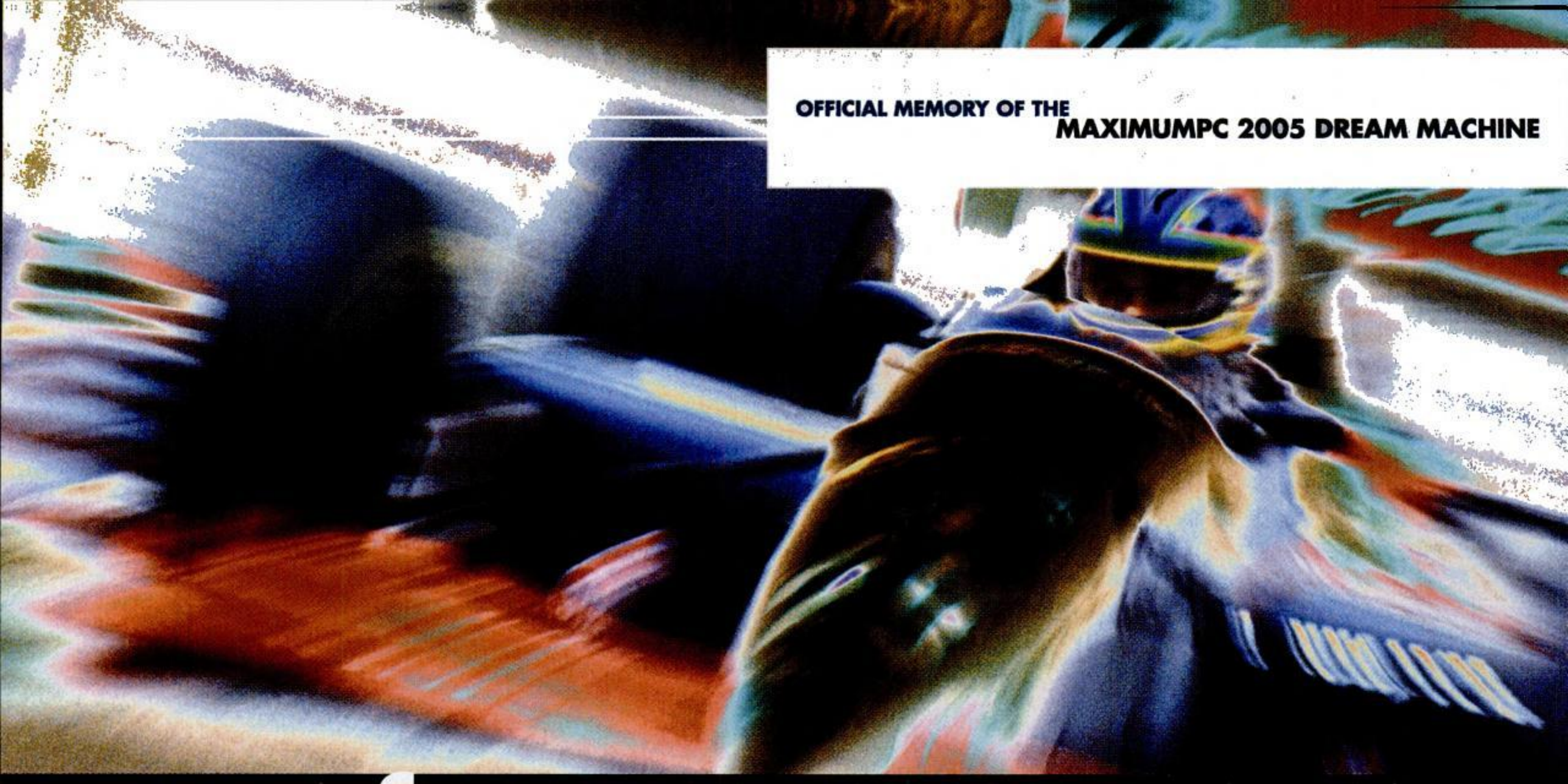

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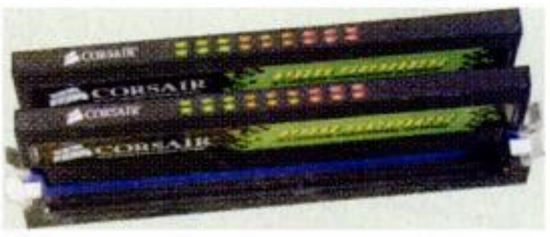

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Contents

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Introducing: The All-New Maximum PC!

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Welcome to the new and improved *Maximum PC*. When we began planning the magazine's redesign, I had only one goal: to make an already kick-ass magazine even better—to do a better job informing, entertaining, and delighting you. We've rejiggered a few sections, moved some bits and pieces around, and added a whole new department. It was an ambitious redesign, but after six long months of prototyping and finessing, the new *Maximum PC* has surpassed all my expectations.

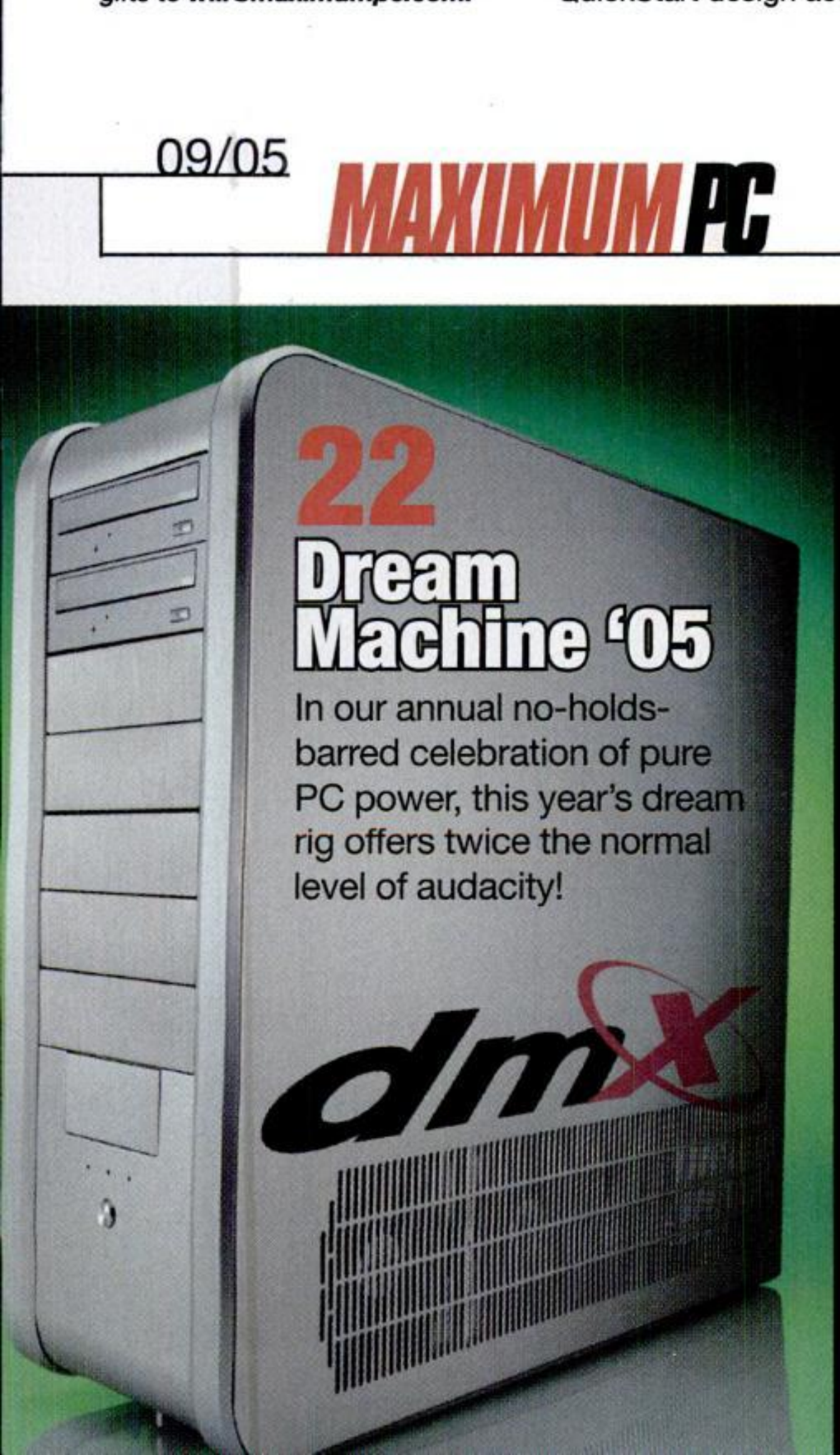
The first thing you'll notice is our new regular department: R&D (it's on page 62). R&D takes an up-close look at technology, both current and future. We'll open every month with a technical white paper (this month we explain how OLED displays work), and then follow up with a Hardware Autopsy, in which we take apart a different piece of hardware, photograph its innards, and show you exactly how it all works. The final piece of the R&D puzzle is our new Preview section. In Previews, we'll take an up-close look at an upcoming product or technology that promises to have an impact on your PC experience. I'm really excited about this latest addition to *Maximum PC*. I hope you are as well.

You'll also notice a few other changes; the most drastic is in our QuickStart department. Our new QuickStart design accommodates more articles, so we won't ever again be forced to choose between a story on geeks' sex lives or Microsoft's rumored P2P app (*both* stories are on page 14). We also applied some space-saving changes to every other section in the magazine. The upshot? We now have more room for text, and we can run larger images in every section of the mag, from the how-to department to our hard-hitting reviews.

That's it! That's all we've changed. We're not changing the focus or the direction of *Maximum PC* one whit. You can expect the same hard-hitting reviews, exciting feature stories, and hands-on how-to content you've come to love in *Maximum PC*. We still worship at the altar of Pure PC Power. But you don't have to take my word for it. Just turn to page 22 and take a look at the hardware inside this year's Dream Machine. Inside the brushed aluminum case is the most powerful rig we've ever built. DMX sports two dual-core Opterons, two GeForce 7800 GTX videocards, and two terabytes of hard drive space. The first time I saw DMX encode a full-length DVD to MPEG4 in less than 10 minutes, I was in love. This is a machine I want to wrap up and take home. I know you will too.

Will Smith

09/05 MAXIMUM PC



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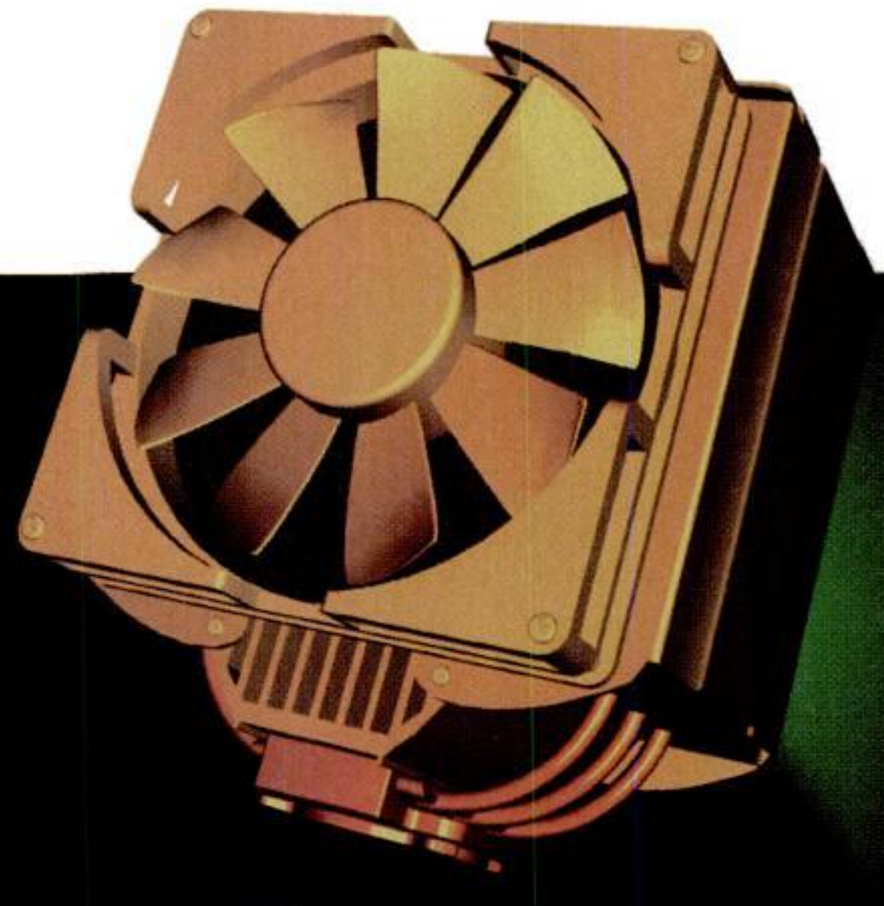

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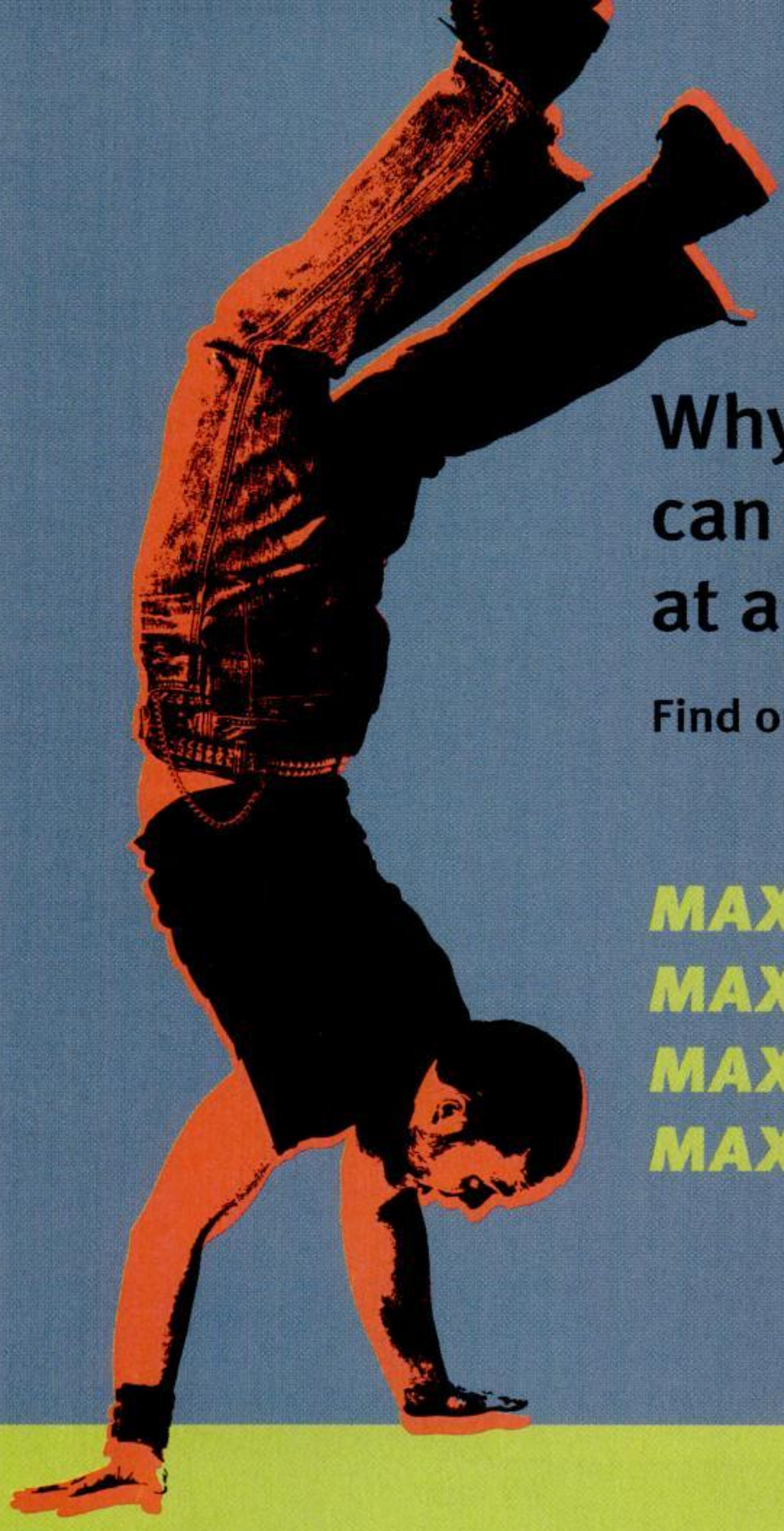

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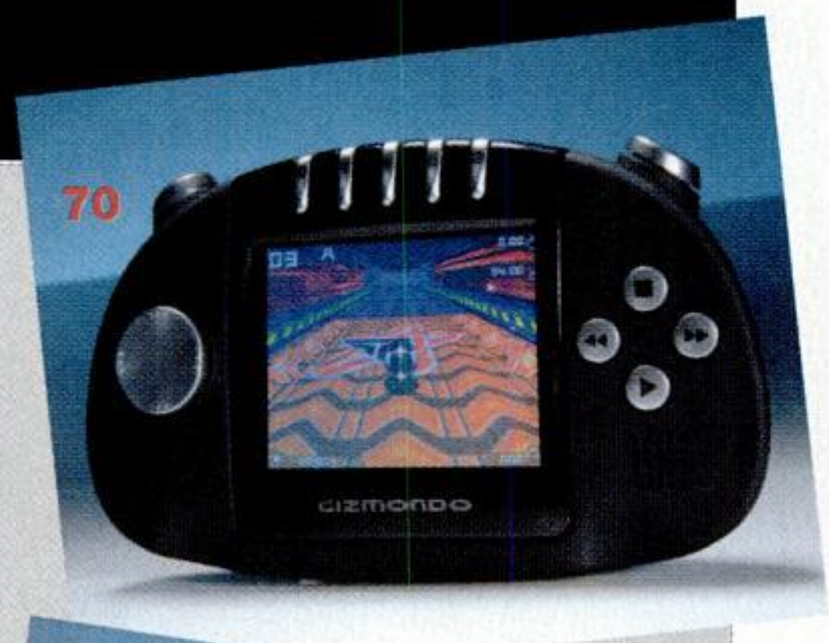

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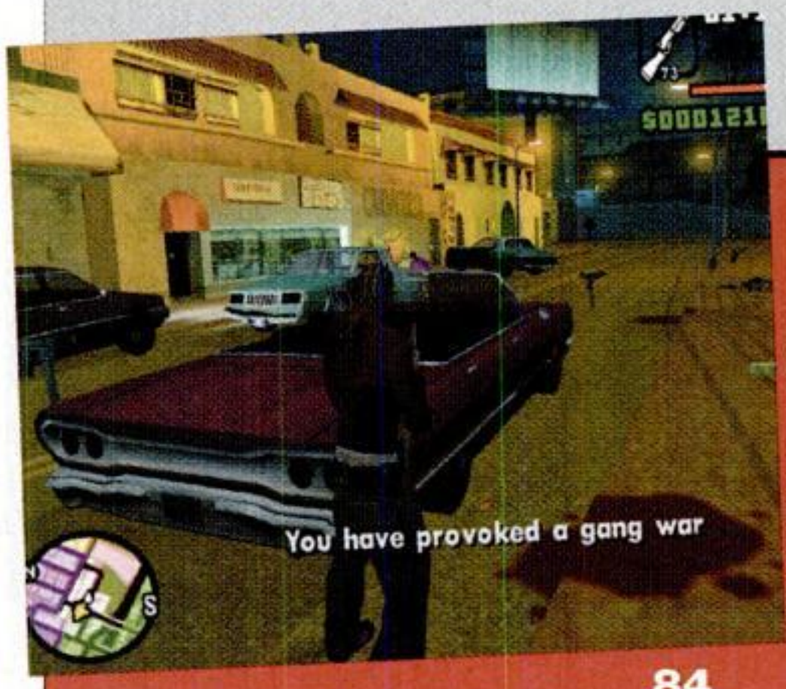

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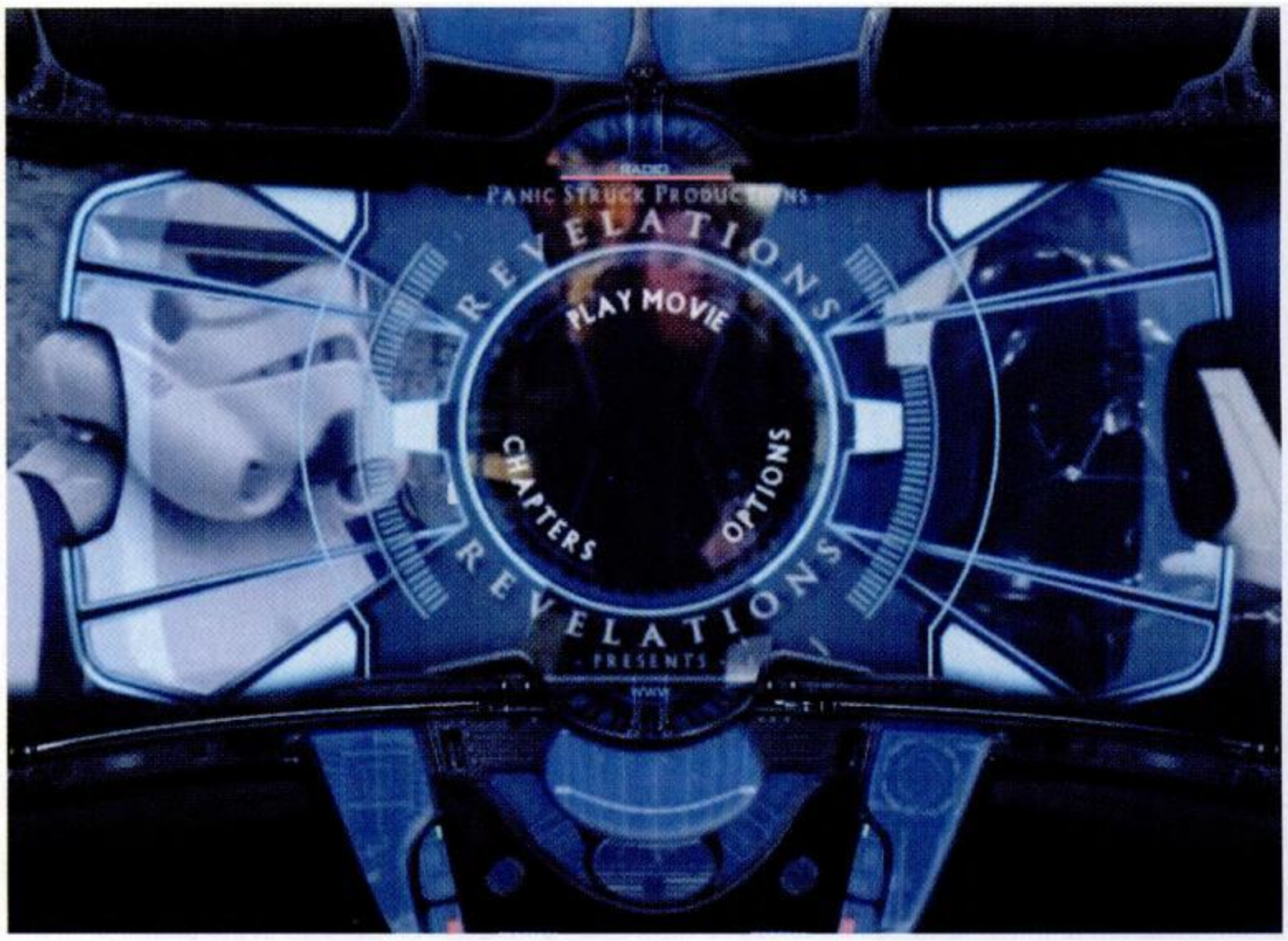
Divx 6 to the Rescue

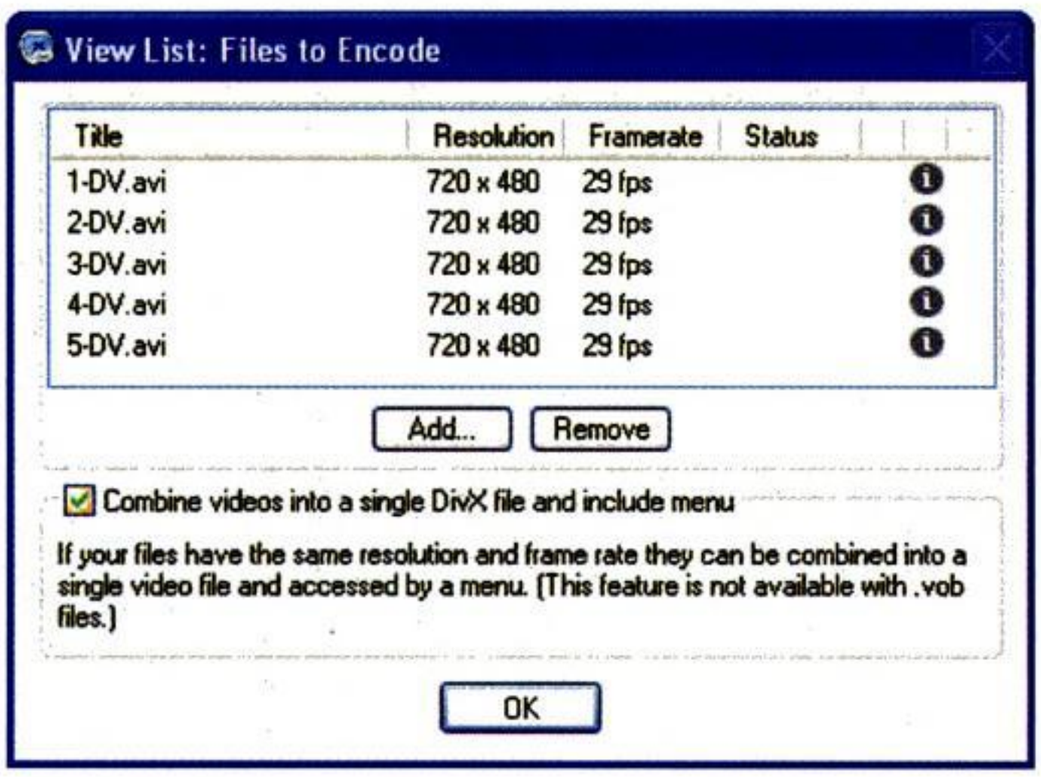
Divx transforms itself from a rogue video-compression codec into a full-fledged media format for encoding, distributing, and playing back video content



This DVD menu is an impressive example of what the Divx Media Format is capable of, once implemented in a third-party authoring application.

While manufacturers squabble over high-definition DVD formats, Divx has delivered an unexpected twist to high-def video recording and storage with the sixth version of its eponymous codec. The crazy cats at Divx pulled out all the stops this time—Divx 6 includes an easy-to-use video converter, a highly polished codec, and even support for high-definition resolution (720p at 4Mb/s).

The biggest improvement in the latest version is that compressing video to Divx has gotten much easier. Come to think of it, encoding was *never* easy, but the creaky, unstable *Dr. Divx* encoder has been replaced by the effortless *Divx Converter*. You simply drag files you want Divx-ized onto the converter, select a profile (there are configurable presets optimized for different devices, such as a PC monitor or PDA), and click Convert.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4-DV.avi 720 x 480 29 fps
5-DV.avi 720 x 480 29 fps
Add...
Remove
Combine videos into a single DivX file and include menu
If your files have the same resolution and frame rate they can be combined into a single video file and accessed by a menu. (This feature is not available with .vob files.)
OK

With Divx 6 you can roll up several videos into a single .divx file, and you don't even have to be terminally lazy to appreciate its automatic menu generation.

Third-party software developers will get their bellies rubbed by the Divx Media Format, an extension of the codec that supports interactive, animated menus, chapters, subtitles, and alternate audio tracks. When developers integrate the Divx Media Format into third-party video-editing software, end-users (that's us) will have the option to create a single Divx file that behaves exactly like a commercial DVD-Video disc when played.

Divx Converter is the first app to support Divx Media Format. If you drag multiple files of the same resolution and frame rate onto the converter, Divx will automatically generate a handsome menu based on the movie titles, and then it will combine the menu and all the movies into a single file with the .divx extension. The Divx Media Format "virtual DVD" file is playable with the company's free *Divx Player*, and by some consumer electronics devices. Many hardware manufacturers already offer Divx 5 support, and it might be possible to add Divx 6 support via a firmware upgrade.

With enhanced compression ratios and the nifty Divx Media Format, you can pack tons of high-def content onto current-generation DVDs. That's where Divx 6 could find its groove. With two competing standards for high-definition video discs on the horizon—Blu-ray and HD-DVD—and very expensive hardware behind them that will take years to drop in price, why not use the red-laser DVD burner you already have in combination with Divx 6 to record and store high-definition video?

You can download the *Divx Player* and codec bundle for free at **www.divx.com**, or purchase the *Divx Create* bundle for $20. In the meantime, we're currently punishing the new codec in the Lab; check back soon for a comparison of Divx 6 performance and that of other MPEG-4-compliant codecs.

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Pentium D—a Trojan Horse?

Intel quashes rumors about DRM hidden in its newest CPU

Not long after the release of Intel's new dual-core CPU, Intel's Australian technical manager Graham Tucker revealed to *Computerworld Today* that the new dual-core chipsets—named 945 and 955—include embedded digital-rights management (DRM) capability. "[The] 945g [chipset] supports DRM, it helps

implement Microsoft's DRM...," Tucker said. This seemed odd, because Intel never mentioned it at product launch.

As it turns out, Intel didn't mention it because there is no DRM in its new chipsets. *Maximum PC* spoke with Intel PR Manager Dan Snyder about the rumors, and he flatly denied them. "We don't have any of that [DRM] wired into our chipset or processors," said Snyder. "The reports are false," he added.

Lawsuit

AMD Releases a New Weapon in War against Intel: Lawyers!

Flurry of antitrust suits filed in U.S. and Japan

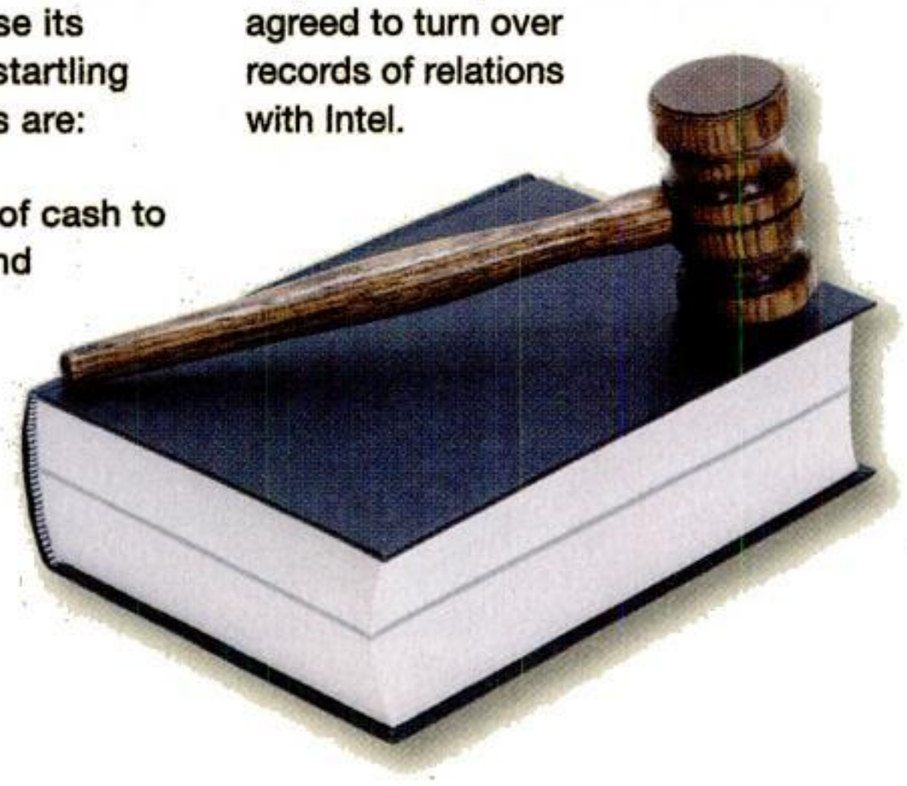
This is the big one, Elizabeth. The whole chihuahua. Or whatever it's called when a small, feisty company drags its much-larger arch-rival into court via a smattering of lawsuits designed to level the playing field once and for all. In suits filed in both U.S. Federal Court and overseas, AMD alleges that Intel engages in antitrust activities to limit AMD's market share and increase its own. Some of the more startling allegations from the suits are:

- Intel paid large sums of cash to big OEMs such as Dell and Toshiba to not buy AMD products.

- Intel threatened Acer with "severe consequences" for supporting the Athlon 64 launch.

- Compaq's ex-CEO said the pressure put on his company by Intel to not buy AMD products was the equivalent of having "a gun to his head."

Naturally, Intel says it "strongly disagree[s] with AMD's complaints," stating it would "respond appropriately." As of press time, only nine companies out of 38 had agreed to turn over records of relations with Intel.



FAST FORWARD

TOM **HALFHILL**

Apple's x86 Gamble

Apple had reasons for ditching PowerPC in favor of Intel's x86. But Apple is taking a big chance with the future of the Macintosh and might be giving up more than it's gaining.

The main reason Apple switched was to acquire faster processors. In particular, Apple is hurting for a low-power processor competitive with Intel's Pentium M, at a time when about half of all computers sold are notebooks. Apple probably won't save money by switching, and Macs probably won't get cheaper. My sources say Apple pays about $100 per PowerPC chip. Intel's average price is closer to $200. Theoretically, Apple can make up the difference by leveraging commodity-priced x86 chipsets and motherboards—or can it? Apple says x86 Macs will continue to be proprietary, which could mean some components won't be commodity products.

Understand that when Apple releases the x86 version of Mac OS X, you won't be able to buy a copy and install it on your Wintel PC. Apple says Mac OS will run only on x86 systems from Apple. To keep hackers from subverting this strategy, Apple must rig Mac OS with super-strong protection, which almost certainly requires a hardware-software security solution—the equivalent of a built-in dongle. Will x86 Macs have special chipsets or motherboards? Maybe, but I think Apple will use Intel's LaGrande security technology to keep the Mac proprietary.

If Apple is using LaGrande, it might explain why the first x86 Macs won't arrive for a year, and the full transition will take even longer. Apple is probably waiting for LaGrande to ship and also needs time to cripple Mac OS so it won't run on other x86 PCs.

Meanwhile, sales of obsolete PowerPC Macs are sure to decline, and some software developers will balk at porting their programs to x86. Many developers just finished porting to OS X from OS 9. Although millions of Mac users still use OS 9 to run legacy software, Apple says the x86 Macs won't run the older operating systems or any software written for the original 68000-based Macs, so the new platform will leave a great deal of software behind.

Most people resist buying Macs because they're more expensive and run less software, not because they fear Macs have slower processors. Apple's switch to x86 won't remove either obstacle.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS MCDONALD

The Return of Funny

It's been said that if you wait long enough, everything comes around again. While clever, dialog-driven platform/puzzle adventures with quirky characters never really go away, they seem to have gone on an extended vacation as of late, only to return after most people have forgotten how much fun they are. This makes them feel spring clean and daisy fresh.

And in fact, that's what *Psychonauts* is: a daisy on the scarred battlefield that represents the excess of combat games currently hogging shelf space at the local PC game retailer. We're awash in combat games these days, but there used to be another dominant tone in gaming, of which Tim Schafer's clever dialog was a key part. The early Lucas Arts adventures were the gold standard of PC gaming: clever, light, fun, and quotable. They brought a joy to gaming that has since been replaced with grim determination and gritty violence. There's nothing wrong with blood, bullets, and muscle, but it's been too long since a game has made me laugh, which might explain why a children's game (*Lego Star Wars*) appealed to me so much last month, and why this month Psychonauts is getting such a vigorous workout. (In the interest of full disclosure, I should point out that, sin of sins, I'm finding the game more fun to play on Xbox than on the PC. The keyboard-mouse control combo is a little clunky, and unless you have a PC gamepad, you might find it hard to adapt to. Plus, my couch is more comfortable than my desk. In the contest between my butt and my loyalty to the PC, my butt will always win.)

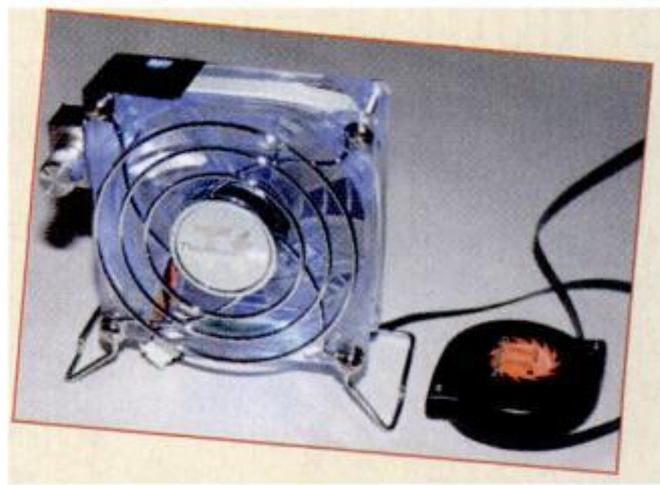
Psychonauts is dazzlingly clever, with levels that take place inside the frequently twisted mindscapes of some truly warped characters. It has an almost bottomless well of clever dialog and funny situations, all of it driven by strong jumping/puzzle-solving elements. And while the gameplay is very, very good, that's not why you come to a game like this. If you do, then you'll pass through too quickly, and *Psychonauts* is a game that rewards lingering, exploring, and wandering with the kind of laughs found too rarely these days.

Tom McDonald has been covering games for countless magazines and newspapers for 11 years. He lives in the New Jersey Pine Barrens.

Thermaltake Mobilefan II+

TESTED & GEEK APPROVED

We originally ordered a couple of these USB-powered fans to sit on our Lab benches and cool components we had sitting out in the open. But these days, instead of cooling hardware, they sit on our desks, cooling us, which makes us feel pampered. The fan speed is adjustable, and each unit has three blue



LEDs, a retractable cable, and a cute little stand. $15, www.thermaltake.com

ATI's Next-Gen R520 GPU Delayed

Perhaps it's just caught in the crossfire

Now that nVidia has launched its heavily revamped 7800-series GPU, all eyes have turned to the frosty Canadian northlands to see how ATI's long-awaited R520 GPU compares. Unfortunately, it looks like it's going to be a long, DMV-style wait, as the R520 is nowhere in sight despite the fact that ATI had a board up and running at E3 in May.

In its defense, an ATI spokesperson declined to characterize the R520 as being "delayed," but did tell us that "ATI would have liked to have had the part available by now, but we're currently targeting a late-summer launch." The only official information about the R520 available at press time is that it will feature a 90 nanometer process and will support DirectX Shader Model 3.0. This delay is the latest chunk of bad news from the graphics company. While nVidia was announcing worldwide availability of its GeForce 7800 GTX, ATI was reporting a third-quarter net loss of $400,000. ATI is also forecasting reduced earnings in the upcoming quarter, specifically because it doesn't have its new graphics card on store shelves.

ATI's delayed R520 card will look similar to this X850 card, or not.

Supreme Court Rules on File Sharing

Decision against Grokster spells trouble for P2P networks

In a highly publicized ruling, the U.S. Supreme Court has decided that file-sharing networks can be held liable for damages if the companies intend their software to be used primarily for illegally obtaining copyrighted material. The ruling strikes a major blow against P2P apps such as *Grokster* and *Morpheus*. The makers of those apps have always argued they can't be held liable for what their clients do with their software.

In the decision, Justice Souter wrote, "We hold that one who distributes a device with the object of promoting its use to infringe copyright is liable for the resulting acts of infringement by third parties."

The ruling certainly put a smile on the faces of executives at record labels and movie studios, but how it will affect end users is uncertain.

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Power Can be a Beautiful Thing.

"When we introduced Nalu to the world for the first time, she had to be perfect. Our NVIDIA GeForce 6800 set a new standard for graphic realism that would be compromised if it wasn't supported by the finest components. That's why we use Antec power supplies for many of our reference and product launch systems. With anything less than the clean, stable power provided by Antec PSUs, our vision may have been diminished."

Tri Huynh
Senior Engineer, Corporate IT
NVIDIA

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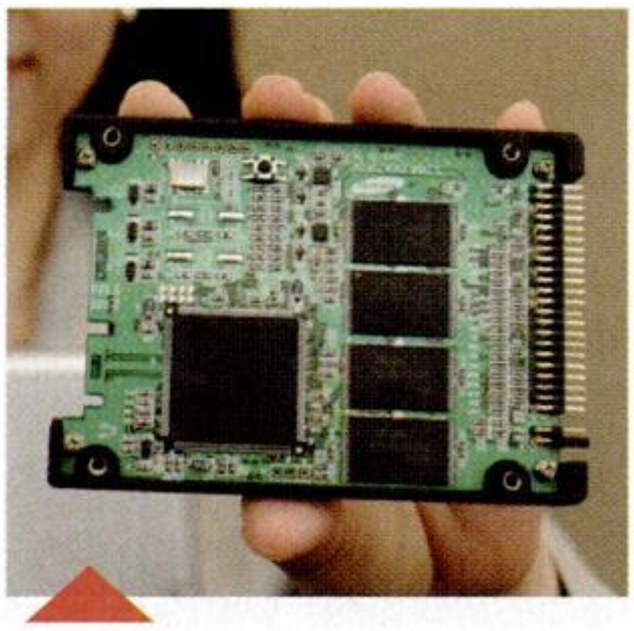


Toshiba's flash drive delivers read speeds equivalent to a 10,000rpm Raptor.

Notebook Drives Go Solid State

Toshiba has developed the world's first solid-state hard drives using NAND flash memory, with plans to slot them into Tablet PCs and sub-notebooks in the near future. Compared with traditional platter-based drives, the flash drives run faster, quieter, and sip only 5 percent of the power required by a mechanical drive. Unfortunately, at this time capacity is limited to 16GB.

PCI Express Goes Outside the Box

New cable could allow videocards to run from external enclosures

If you're keen to keep your heat-generating videocard(s) away from your heat-generating CPU, a new external PCI Express cable spec being considered might be just the ticket. The fledgling spec offers so much bandwidth it could let you run an external videocard, soundcard, and other PCI-E devices.

The spec is being developed by the PCI Special Interest Group (SIG), whose goal is to use PCI-E for external storage purposes. But with 5Gb/s per wire of bandwidth—more than twice what's available over current PCI-E implementations—the spec would be more than able to handle graphics card data *and* storage duties. Read all about it at **www.pcisig.com.**

That little box on the desktop is a drawing of a videocard enclosure. Yes way!

Microsoft Enters P2P Fray

Microsoft has announced its intention to offer its very own P2P file-sharing client that will solve the problems currently associated with the popular BitTorrent protocol. Researchers at Microsoft's Cambridge lab are developing the new system, code-named Avalanche, and they claim that download times are at least 20-30 percent faster and in some cases 200 percent faster than BitTorrent.

Microsoft is attempting to solve the biggest problem facing BitTorrent users, which is that seeders—machines that have the complete file—are required to complete a download. If you download 99.9 percent of a file and the last seeder with the 0.1 percent of the file you need disconnects, you cannot complete the download. It's frustrating, to say the least.

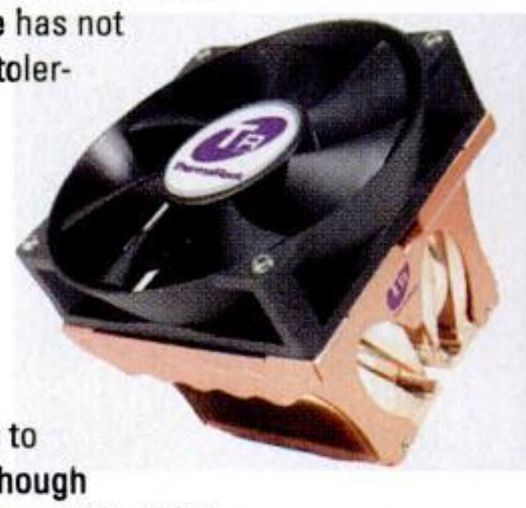
Microsoft claims to have bypassed this situation by encoding all the pieces of the file with information about the entire file (using a technique similar to that used by RAID arrays with parity). BitTorrent treats each chunk as a stand-alone piece with no information about the other pieces. Avalanche, on the other hand, inserts data about the whole file in each chunk, so if you collect enough chunks the application can recreate missing data, spontaneously regenerating the missing chunks so you can complete the file.

It's a novel approach, but BitTorrent's creator—Bram Cohen—is dismissive. His main complaint is that at this stage, Avalanche is "vaporware," in that it's not a running system but merely a research paper based on simulations. "I think that paper is complete garbage," says Cohen. As of press time, there was no indication Microsoft would release a beta of Avalanche for testing purposes.

FUNSIZENEWS

READY TO ROCK

If you're enamored of the offerings from PC cooling and case-maker Thermaltake, but think some of its stuff is a bit too—how do we say this?—*gaudy*, for your tastes, we have some good news for you.



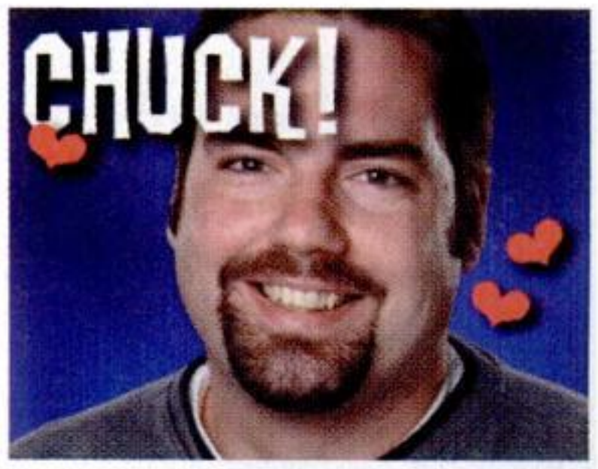
No, Thermaltake has not adopted a zero-tolerance policy on bling, but it has spawned a new subdivision named Thermalrock that will offer similar products to Thermaltake's, though with fewer flashing LEDs, light-up checkerboards, and 30 percent less orange. Check out the small selection yourself at **www.thermalrock.com.**

DUAL BORE

The PC upgrading crowd is taking a wait-and-see approach to Intel's new dual-core CPU, according to Taiwanese motherboard makers, who are reporting soft demand for the new 945G dual-core chipset. Sources say Intel's goal was to have dual-core CPUs account for five percent of all its LGA775 processor sales in the second quarter, but it didn't meet that goal. Our take? It's pretty clear Intel might have received a warmer reception to its dual-core procs if it hadn't forced customers to upgrade their motherboards at the same time.

GEEKS ARE GOOD IN BED

Obviously, we've known this to be true for some time now, but a recent study published by the *New York Daily News* confirms that technology enthusiasts are as hot as an overclocked LGA775 3.6GHz CPU with a 1066MHz FSB. "A nerd is an excellent provider and a guy who puts you first," says *Elle* magazine's love and sex columnist in the report. "He'll turn out to be a great father and a great husband." Damn straight!



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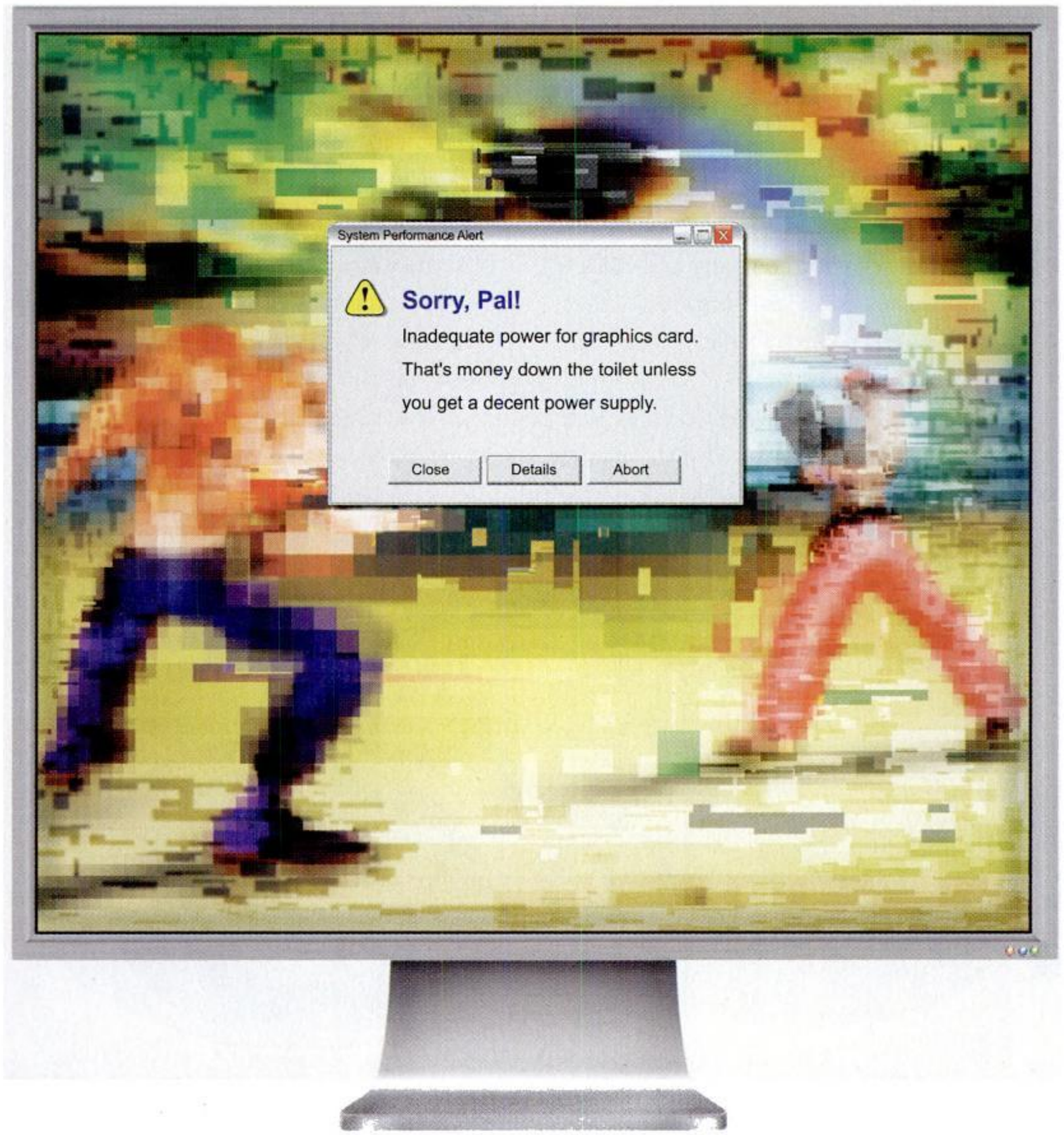

Don't forget to upgrade before you upgrade

With new graphics cards and high-capacity hard drives, you're ready to take your system to a whole new level. But beware! What happens when you power up these new components could be underwhelming - especially without enough cool, stable power to drive them. That's where Antec comes in - the upgrade before your upgrade. Our power supplies let you take full advantage of today's incredible high-performance computing power. Find out more at **www.antec.com.**

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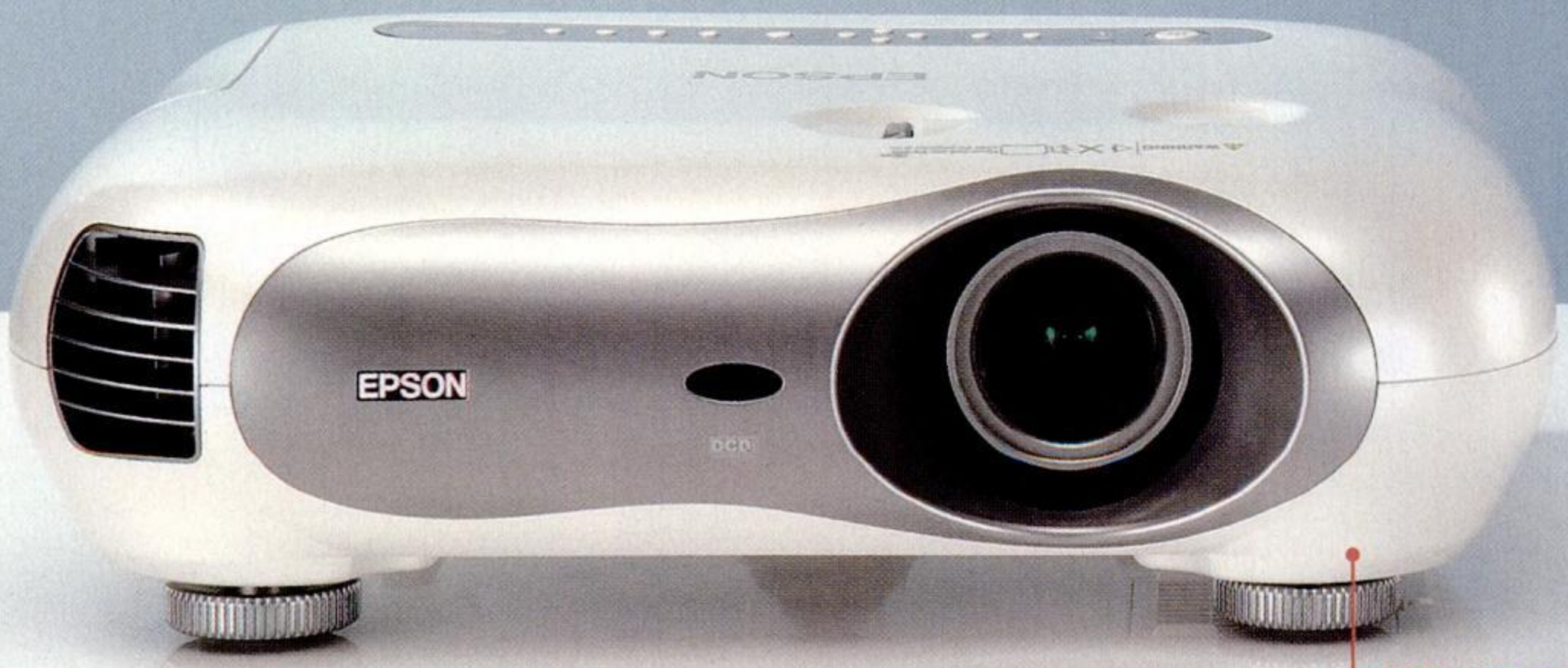
Projectors: LCD **vs.** DLP

When it comes to games and movies, nothing delivers more visual excitement than a large display. And when it comes to large displays, nothing can beat a video projector. Eyeing one of those 24-inch LCD monitors for your desktop computer, or a 60-inch plasma behemoth for the media center PC in your family room? *Bah!* Hook up a video projector and you can beam a 300-inch picture right into your living room!

Imagine playing your favorite games and watching movies in which the characters are literally larger than life. That's what 25 feet of display area (measured diagonally) can do for you. Don't have the space for such a large image? No problem. Unlike a flat-panel monitor, a good video projector can easily scale the size of its image and its aspect ratio without exhibiting any visible distortion.

Two dominant projection technologies are battling for supremacy today: LCD (liquid crystal diode) and DLP (digital light processing). DLP is a proprietary technology developed by Texas Instruments and licensed to a number of projector manufacturers. We pitted higher-end models of each type of technology against each other to see which is superior for computer applications.

BY MICHAEL **BROWN**



LCD video projector: Epson PowerLite Cinema 500, $5,000, www.epson.com

round 1 MOVIES

As we watched the opening scenes from Terrence Malick's WWII masterpiece *The Thin Red Line* on Epson's PowerLite Cinema 500, we immediately knew that LCD projector technology was going to have trouble on this score. LCD projectors don't produce as much contrast as DLP projectors, and this was readily apparent in our semi-darkened room. Much of the detail in the film's jungle scenes was lost in the shadows. The contrast issue became less of a problem at night, when we could fully darken our viewing room. LCDs can also have trouble with vertical banding, caused by gaps between the LCD's pixels (commonly referred to as the "screen door" effect). The Epson exhibited this flaw in several scenes, although it was visible only when viewed at very close range. **WINNER: DLP**

round 2 PC PROGRAMS

DLP technology derives its name from the way it creates a pixel: Light from the projector's lamp reflects off thousands of tiny mirrors on the surface of a silicon chip. Light directed into the lens path turns the pixel on, while light directed away from it turns the pixel off. In the process, the light passes through a spinning wheel with red, green, and blue segments (Viewsonic's PJ755D's color wheel has a fourth segment—transparent—in order to increase its brightness). Because the DLP projector's pixels are produced by mirrors, they tend to have fuzzier edges. This becomes most apparent when viewing text on screen, and it gives LCD technology the edge when viewing word-processing documents and spreadsheets. **WINNER: LCD**

round 3 GAMES

Neither projection technology had any trouble keeping up with *Need for Speed: Underground 2*. The game looked spectacular on both projectors. The DLP projector's fuzzy-edged pixels, however, make its video images look smoother, and this phenomenon carries over to games. On the other hand, some DLP projectors are known to suffer from a "rainbow" effect: As the spinning wheel modulates colors, distinct red, green, and blue elements separate out. We thought this problem might surface with games, but it didn't; perhaps because the PJ755D's wheel spins twice as fast as other projectors (120Hz) to suppress the problem. If it weren't for DLP's superior contrast performance, we'd call this one a tie; as it stands, we give DLP the edge in this category. **WINNER: DLP**

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round 4 NOISE LEVEL

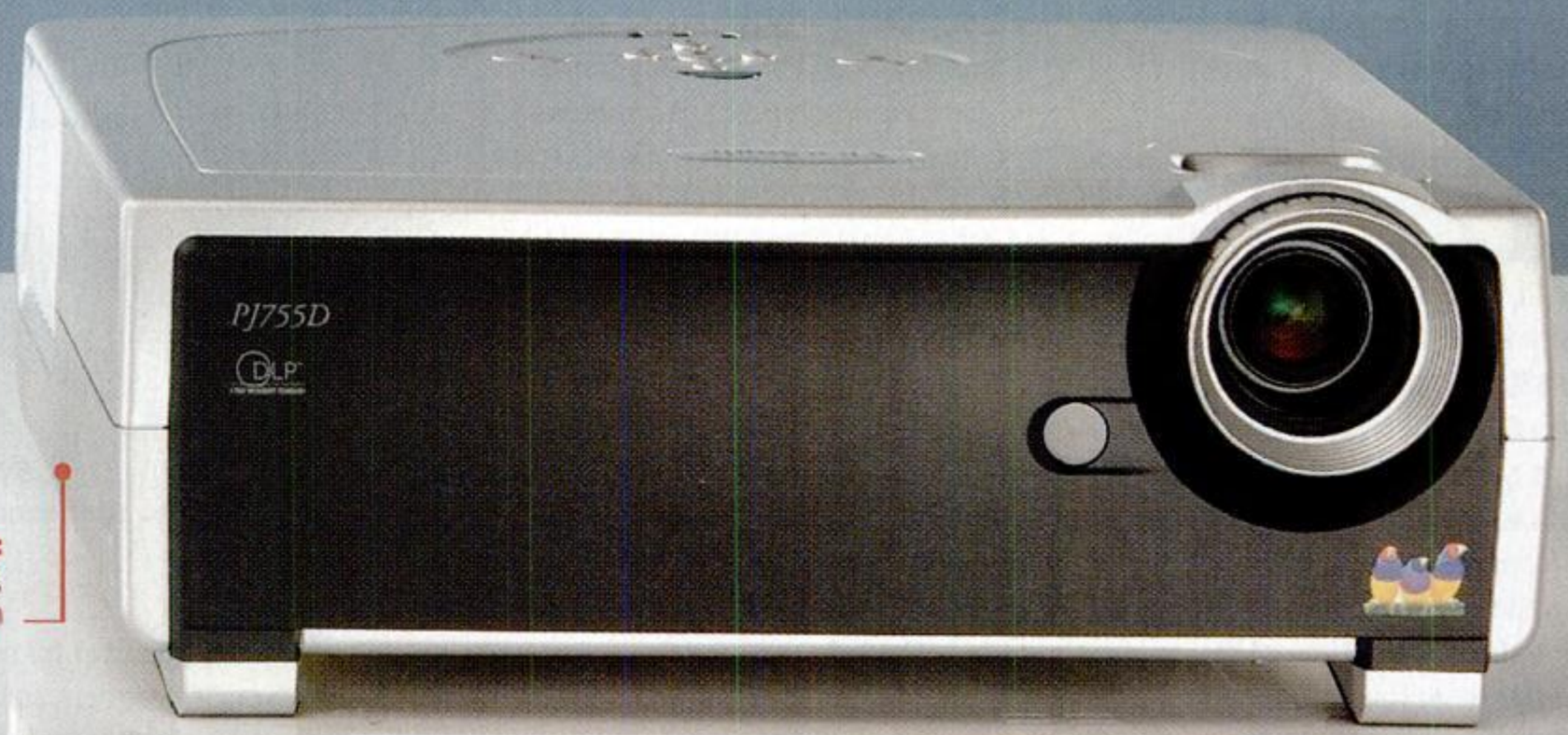
PC noise levels have long passed the point of being ridiculous, so we can hardly be pleased with a display device that adds to the cacophony. Unless you're fortunate enough to be able to stash your projector in a ventilated, sound-proof booth—or you can darken your room well enough that you won't need to run a projector at its high-brightness settings—you'll want to go with a cooler-running DLP model. Epson's PowerLite Cinema 500 is rated lower than Viewsonic's PJ755D in quiet mode (27dB versus 30dB), but the LCD's much brighter "Dynamic" and "Living Room" modes are considerably noisier than the DLP projector's brighter modes: 36dB for the Epson, compared with the Viewsonic's 33dB. We'll let you make the call on this one. **WINNER: TIE**

round 5 FOOTPRINT/WEIGHT

Let's face it, most people's living quarters aren't getting any bigger. And if you're the take-it-with-you type (whether it be to a LAN party across town or a block party right outside your door), you'll appreciate the compact dimensions that DLP projectors can boast. Whereas projectors like Epson's PowerLite Cinema 500 use three LCD panels, DLP projectors like Viewsonic's PJ755D require only a single silicon chip. This translates to footprint dimensions of 13.6-inches deep, 17.7-inches wide, and 5.8-inches high for the Epson. Although the Viewsonic is only slightly smaller—measuring 13.0-by-3.9-by-10.6 inches—it tips the scales at just 7.5 pounds, compared with the Epson's 13.8 pounds. And the Viewsonic comes with a carrying case. **WINNER: DLP**

round 6 COST OF OWNERSHIP

If you're seriously considering the purchase of a video projector, don't forget to take the cost of ownership into account. Epson rates the useful life of its bulbs at 3,000 hours, but only when its dimmer display modes are used. Use the projector exclusively in its brightest modes, and the bulb's useful life drops to 1,700 hours. Street price on a replacement bulb: $330. Viewsonic rates the PJ755D's lamp at 1,500 hours (the company maintains the bulb's lifespan can be stretched to 4,000 hours if used exclusively at its dimmest settings). Street price on a replacement bulb: $365. And unless you're planning to project your images onto a white wall, you'll need to purchase a projection screen. A medium-size (106-inch diagonal) screen with a 16:9 aspect ratio will set you back anywhere from $200 to $300.
WINNER: TIE



DLP video projector:
Viewsonic PJ755D, $3,000,
www.viewsonic.com

And the Winner Is...

We went into this comparison expecting the larger and more expensive Epson Cinema PowerLite Cinema 500 to carry the day for LCD technology, beating out Viewsonic's smaller, cheaper (relatively speaking) PJ755D DLP projector. But the more we tested the two products, the more we came to appreciate DLP's improved contrast, smooth visuals, and smaller footprint.

We were equally surprised at how capable both video-projector technologies are when it comes to scaling video. Epson's projector delivers higher native maximum resolution—1280x720 with a 16:9 aspect ratio—versus Viewsonic's 1024x768 with a 4:3 aspect ratio. Based on those specifications, some would argue that the Epson is the superior product for high-definition television. But to our eye, it was impossible to detect any visual distortion when the Viewsonic compressed high-def video. Besides, HDTV comes in more than one format—720p (1280x720, progressive) and 1080i (1920x1080, interlaced)—so even projectors with a native resolution of 1280x720 must perform compression when presented with a 1080i HDTV signal.

Although we've picked DLP projector technology over LCD, bear in mind that we chose higher-end models of both technologies in order to put the two camps on equal footing. (We could have selected even more expensive models, but decided to cap prices at $5,000.) We've pointed out some of the flaws present in both LCD and DLP technologies—even though we didn't experience all of them with these particular products—so you can look for them in any projector you're considering buying. MPC

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This Month: The Dog Goes after...

➡ Intuit ➡ NeoScripter ➡ Belkin ➡ Apple

SUNSET THIS

The Dog's July column on Intuit "sunsetting"—turning off features on older versions of software—churned up quite a bit of mail. Cletus Hunt said the Dog was flat wrong:

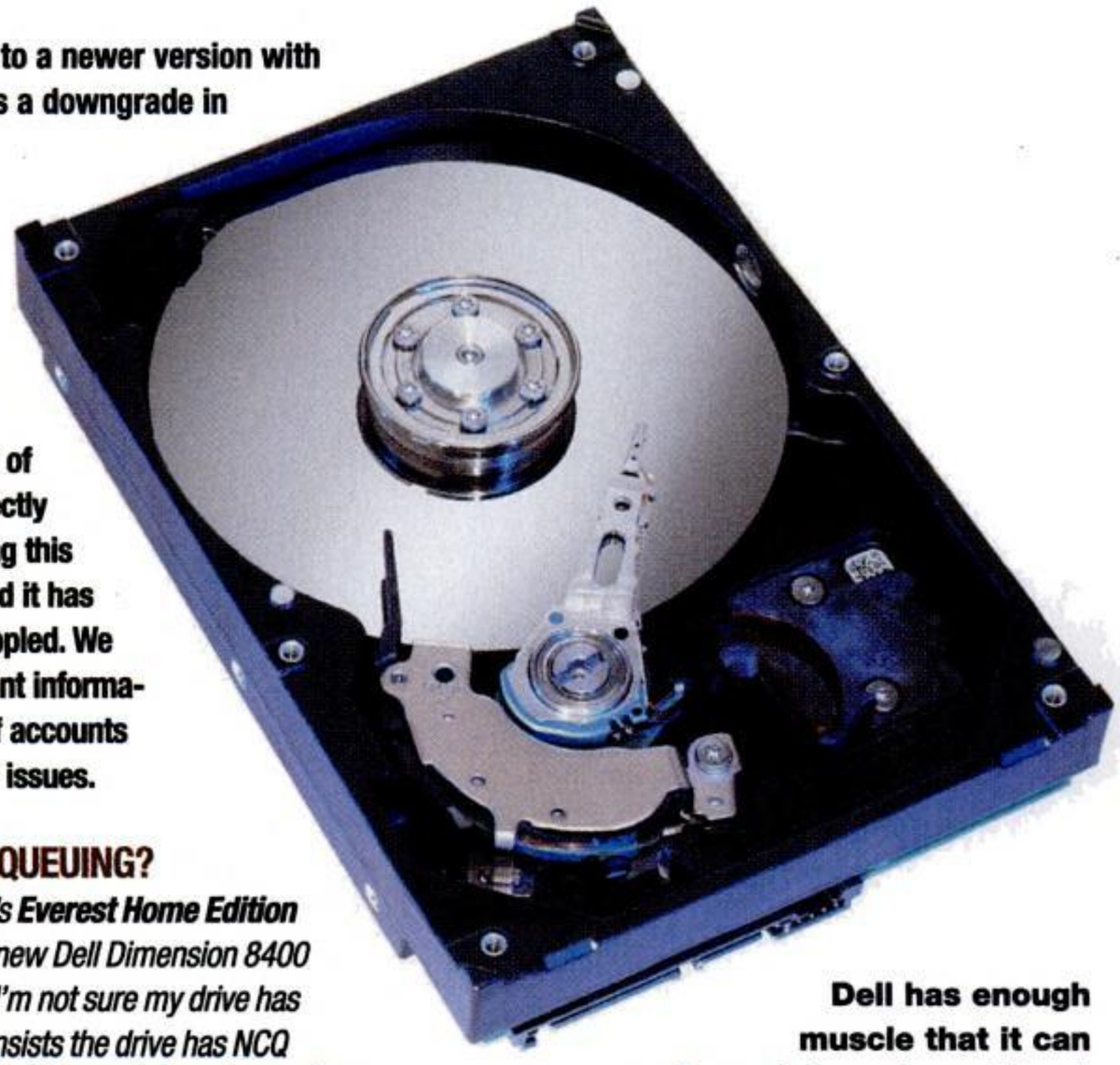
"You had some errors in your response about Intuit's sunset policy. You said that with the online automation features turned off, *Quicken* is essentially useless as a financial-tracking device. Not true, it works the same as before, you just have to enter transactions and other data yourself. It might be inconvenient, but not useless. Older versions of *Quicken* worked fine before they added all the online stuff, and the newer sunsetted versions work fine with these features turned off.

"Also, you first said the company gives you a $20 discount for upgrading (true), but then you said the upgrade fee is $20. This is not true. Direct from Intuit, *Quicken Deluxe* is $59.95, which combined with Intuit's $20 discount makes the upgrade fee $39.95. You can also get the software at Walmart for $39.95 with no rebate, which just makes Intuit's generous $20 discount meaningless. I am a *Quicken 2002 Deluxe* user and I don't plan to pay for an upgrade."

Actually, Cletus, Intuit was offering a $20 upgrade for *Deluxe* at the time of the original story. That offer is no longer available. But the Dog digresses. Brian Fields also chimed in to say that "sunsetting" the older features isn't the only problem:

"Unfortunately, I too fell for the sunsetting/upgrade-now scheme. After installing the new version, I found that I could no longer download transactions from my bank—which uses the .qif format. A quick check on Intuit's website confirmed that the company no longer supports the "aging" format. I contacted my financial institution (a local credit union), and they claimed it was a massive scheme to stop the use of the open .qif format and bilk the banks for licensing fees on *Quicken's* proprietary file types. Regardless, I upgraded to a newer version with less functionality. That's a downgrade in my opinion."

Finally, John Buxbaum had to say that although Microsoft's official policy is to sunset features in *MS Money* after two years, his copy of *Money 2002* works perfectly fine. "We have been using this version for four years and it has not, repeat, *not* been crippled. We still download our account information for an assortment of accounts without any problems or issues.



Dell has enough muscle that it can get special versions of hard drives that aren't available to consumers.

NCQ: NO COMMAND QUEUING?

I was using Lava System's ***Everest Home Edition*** *to check all the parts in a new Dell Dimension 8400 that I bought in April, and I'm not sure my drive has NCQ. Dell's tech support insists the drive has NCQ enabled, but when I checked the model number on the Internet, it said the drive does* not *have NCQ. Am I being flimflammed? The drive is a Seagate Barracuda 7200.7 SATA with a model number of ST3160023AS.*

–David

The Dog chewed bones with a Seagate spokesman who confirmed that Dell can and does indeed buy the ST3160023AS with NCQ enabled even though the retail part does not support it. How is that possible? The spokesman said, "Seagate sometimes uses different model numbers for configuration tracking with OEMs vs. distribution." OEMs are PC manufacturers, while distributors are generally stores. The spokesman went on to say, "The following model numbers were pre-NCQ for both distribution and OEMs: ST3160023AS, ST3160021AS, ST3120026AS, ST3120022A, ST380013AS, ST380011AS, ST340111AS, ST340014AS. When Seagate implemented NCQ on SATA drives, we changed the model numbers only for the products sold to distributors. The purpose of the change was to easily identify which drives had NCQ and which did not, because distributors use the model number for such identification. The below model numbers are the newer ones that support NCQ and are used only in the distribution channel: ST3160827AS, ST3120827AS, ST380817AS. For OEMs, however, changing a model number is irrelevant, and is often a nuisance. OEMs do not refer to model numbers to track what drives they are buying, they use the part number of the drive (which reflects more specific information). For OEMs only, the previous model numbers (pre-NCQ) were maintained even after we implemented NCQ:

"1) If you have a model ST3160827AS, ST3120827AS, or ST380817AS, then you definitely have NCQ and it was obtained through a distributor.

2) If you have a model ST3160023AS, ST3120026AS, or ST380013AS, *and it was purchased from a distributor,* it does *not* have NCQ.

3) If you have a model ST3160023AS, ST3160021AS, ST3120026AS, ST3120022AS, ST380013AS, ST380011AS, ST340111AS, or ST340014AS, and it was purchased from an OEM, you cannot tell from the model number alone whether the drive supports NCQ." In other

Continued on page 20➔

Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic The Dog on them by writing **watchdog@maxumumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

Bella, Watchdog of the month

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Continued from page 18

words, if Dell says it has NCQ, it has NCQ. The spokesman also wanted to reiterate that many people use the term "OEM" to refer to bare drives. "That is a misnomer applied by many resellers to all 'bare' drives not in a retail kit box. That kind of drive is actually a 'distribution' drive and fits into summary numbers 1 and 2 above."

NOT THE ONE

I work for the local government and we got a license for ***NeoScripter*** *sent to us from the company. When trying to install the software, however, the license was invalid. I called and emailed the company, and guess what? It no longer exists, despite the fact that the software is still being sold from different markets, mostly overseas.*

–T.J. Richardson

New Jersey-based NeoScripter.com is still up, but apparently there's no one home. The phone numbers for the company were disconnected and emails to the website went unanswered, which is odd, as the web site appears to be fully functional. Attempts to reach the registrant of the website at his home were also unsuccessful, so the Dog is inclined to agree with T.J. Readers are advised to steer clear of NeoScripter's products until the company's status is cleared up. Woof. MPC

NeoScript
NeoScripter
NeoScripter Code Editor and Scripting IDE for Developers is Here!
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NeoScripter 1.8
NEW VERSION!
NeoScripter 1.8
New Sort Feature Sorts lists alphabetically
New Improved Messaga Box & Input Box Wizard for VB.Net code.
New Improved Syntax Files with Case Correction feature. Now you can manually select Autocase and force your code to the appropritae case while typing.
New WAP / WML scripting code completion & syntax just added!
New PHP code completion.

Don't be taken in by NeoScripter.com. While the website appears open for business, you'll be hard-pressed to get a response to any inquiries regarding product support.

Recall **Alert**

If it's not the power supply, it's the battery. This month, three different manufacturers are recalling batteries that might overheat and burst

Belkin says some 10,300 lithium-polymer batteries sold with its Bluetooth GPS Navigation System might swell, overheat, and pose a fire hazard. The company said it has not received any reports of injury, but 15 batteries have overheated and "expanded." The bad cells were sold with Belkin models F8T051 and F8T051-DL between November 2003 and February 2005. The GPS models have the label "Part No. 300-203712001" and the batteries are stamped "Model No. AE-8210." Consumers are advised to immediately stop using the GPS and to contact Belkin for information on how to obtain a free replacement. Consumers can call Belkin at 800.223.5546 x2064, between 8 a.m. and 5 p.m. pacific time, Monday through Friday, or by visiting www.belkin.com.

The lithium polymer in some Belkin Bluetooth GPS units might overheat and burst.

Apple, meanwhile, has expanded a recall of notebook batteries for its iBook G4 and PowerBook G4 computers. The company said about 128,000 batteries manufactured by LG Chem in South Korea might short out and cause the batteries to overheat and potentially catch fire. The lithium-ion cells were sold with 12-inch G4, 12-inch PowerBook G4, and 15-inch PowerBook G4 notebook computers. Consumers are advised to immediately stop using the batteries and to contact Apple at 800.275.2273, between 8 a.m. and 8 p.m. central time, Monday through Sunday. More information is available at https://depot.info.apple.com/batteryexchange/. Once Apple has verified the serial number, the company will ship out a new battery.

Apple has expanded the recall for some notebook computer batteries that pose a fire hazard.

COMPUTER MODEL	BATTERY MODEL	BATTERY SERIAL NO. RANGE
12-INCH iBOOK G4	A1061	HQ441-HQ507
12-INCH POWERBOOK G4	A1079	3X446-3X510
15-INCH POWERBOOK G5	A1078	3X446-3X509

Finally, Battery-Biz is recalling some 10,000 notebook batteries which might, you guessed it, overheat and start a fire. Battery-Biz said it has received six reports of batteries overheating and melting. The batteries are the: B-5301, B-5333, B-5340, B-5341, B-5342, B-5344, B-5345, B-5346, B-5461, B-5615, B-5896, and B-5942/LI. The batteries will have a lot number of 10098, 10198, or 10230, and an additional three-letter date code. The matrix of bad batteries is too extensive to carry here, so if you have one of the above replacement batteries from Battery-Biz, stop using it and visit www.hi-capacity.com/exchange to see if the battery is one of those affected. The company said consumers should be able to use the notebook with just the AC adapter. You can call Battery-Biz at 800.780.6552, between 7:30 a.m. and 4:30 p.m. pacific time, Monday through Friday.

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PHOTOGRAPHY BY MARK MADEO

DUAL EVERYTHING

Dual CPUs? Sure. Dual videocards? Why not? But a mere deuce-deuce wasn't enough for our tenth annual Dream Machine. This time, our wunder-rig is running dual everything! Behold our masterpiece: DMX. She's hand-built and ready to roar!

BY THE MAXIMUM PC STAFF

ROLL CALL OF DUALITY

Here's a list of all the dualisms built into Dream Machine 2005, aka Dream Machine 10, aka DMX

- Dual dual-core processors
- Dual core-logic chipsets
- Dual-channel double data-rate memory
- Dual videocards
- Dual dual-format, double-layer DVD writers
- Dual 24-inch monitors
- Dual-booting OSes
- Two terabytes of storage

Dream Machine X, dubbed DMX, embraces and celebrates the Pure PC Power philosophy. Actually, celebration is an understatement. DMX is an all-week, Mardi Gras-style street party that doesn't close down until the riot police bust out the fire hoses and tear gas.

Dig our specs: dual dual-core processors—that's four cores total—to simulate the kind of processing power that won't be available to mortals until 2007. A pair of freakishly fast GeForce 7800 GTX videocards, each with its own 24-pipe rendering engine. That's

16 more pipelines than a pair of GeForce 6800 Ultras. These 7800 GTX cards are so speedy they process pixels faster than the CPUs can feed 'em data. Five 500GB Hitachi hard drives in a RAID 3 array offer two terabytes of storage with parity support for data protection. To power all this gear, we've included an oversized 850-watt power supply. And in the ultimate celebration of cutting-edgedness, we managed to pilfer Creative Labs' unreleased X-Fi Xtreme Fidelity soundcard for DMX. "What?" you say. "Why bother with a soundcard when onboard sound has gotten so good?" Yes, indeedy— not only is this a world-exclusive debut in the Dream Machine, it's a soundcard that actually lives up to Creative's claims as "the world's most powerful audio processor."

But then, that's what Dream Machine has always been about. With four independent processor cores we have plenty of power to spare for onboard audio, but why shunt those precious, precious clocks to audio if you don't have to? Why include a soundcard? Why include a pair of dual-core processors? Why build in two terabytes of storage? Time and time again, vendors came back with the same response when we outlined our plans: "You're crazy." But that didn't stop us.

Why do we fool with twitchy beta hardware and multi-core CPUs when we could just play it safe and build a slightly faster (but much less future-proof) single-core rig? For the same reason Sir George Mallory attempted Mount Everest: because it's there. We agree, George. Because the hardware's there. Because it's Dream Machine. Because power matters. Because we dream. We build.

CPUS

AMD Opteron 275s

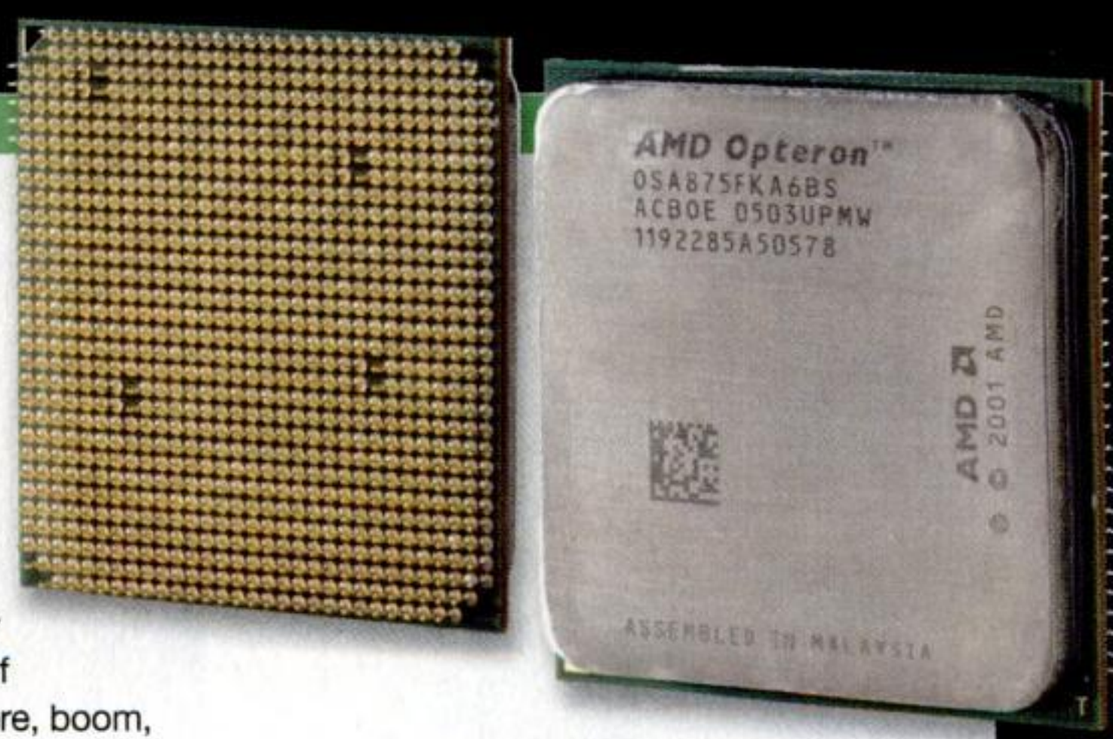
This is where it all begins, folks

With a self-imposed mandate to double up on every component, we knew we wanted not only dual processors, but also dual-*core* processors. This decision would impose restrictions on what motherboard, memory, and videocards we could use, but as you'll soon discover, the final configuration we landed on is still a no-compromises machine.

So why were we so hell-bent on dual-core CPUs? *Because they work.* Even the techno-curmudgeons in our Lab concede that traditional processor design has reached a point of diminishing returns: Clock-speed and cache-size increases can no longer hurdle the performance walls created by heat and physics. Intel and AMD recognized this in 2005, and responded with dual-core CPUs, which essentially integrate two identical CPU engines in a single package.

Skeptical? Peep this: AMD doesn't plan to make further enhancements to mainstream single-core Athlon 64s. Intel, meanwhile, is pushing hard for dual-core procs in not only servers, but also desktops *and* notebooks. Single-core processors aren't dead, but the future is undeniably multi-core.

In fact, CPU manufacturers believe that even lowly consumer PCs will be running *four-core* processors by 2007. We couldn't wait that long, so we grabbed two AMD dual-core Opteron 275s for installation in DMX. That's *four* 2.2GHz CPU cores—8.8GHz of computing power right now, here, boom, in the Maximum PC Lab.



OK, 8.8GHz might be stretching the truth a bit, because even in best-case multi-threading scenarios, not all four cores will be pumping at maximum capacity. But running four 2.2GHz cores in one machine is still enough to swizzle our sticks.

AMD's Opty 275 is basically the same processor as the Athlon 64 FX, but it sports more Hyper-Transport links for a faster connection between the CPU cores and everything else plugged into the motherboard. Each of the two processor cores features 1MB of L2 and its own on-die memory controller (the secret ingredient that puts AMD processors ahead of Pentium 4s in gaming performance). The newest Opterons even feature support for Intel's newest SSE3 instructions.

Because we wanted to run dual-core procs in tandem, our CPU choices were severely limited. We were effectively confined to choosing either AMD Opterons or Intel's dual-core Xeons. And of course, we were committed to running dual videocards, which also had a bearing on our motherboard options. We immediately ruled out ATI's new dual-videocard solution, dubbed CrossFire. The problem with CrossFire is that it must be paired with an ATI core-logic chipset, and no shipping mobos using ATI core-logic support dual CPUs.

We also ruled out Intel's dual-core Xeon platform because of its less-than-stellar SLI videocard performance. So in the end, we went with the only real option for a dual-proc, dual-core, dual-videocard machine: dual Opterons paired with a mobo running the nForce4 chipset.

As luck would have it, this "only" choice was also the *best* choice, which is exactly what we expected to discover when we first started spec'ing out the machine. When we got our first information about dual-core Opterons, we knew they would be strong contenders for this year's Dream machine. And now, 12 months later, we have the benchmark numbers to back it up.

More hardware on page 28

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dmX

BEHOLD! DMX

You're looking at one mother of a PC menagerie

METADOT DAS KEYBOARD: Dig the complete absence of character labeling (you can practically *smell* the Das Keyboard's contempt for untrained typists). Very agro. Very DMX. See page 34 for details on the board's perfectly weighted keys.

TWO PLEXTOR PX-716SAs: These double-layer, dual-format, do-everything drives from Plextor are now available in delicious SATA flavor. Bon appétite!

SILVERSTONE NIMIZ TJ07: We're not sure which is more obscene: The TJ07's nine hard drive bays or its five 120mm cooling fans. We'll take it all.

TWO DELL 2405FPWs: Offering more screen real estate than most desktops can even accommodate, DMX's two 24-inch LCDs add grandeur to even the most mundane applications, to say nothing of DVDs and games.

LOGITECH MX518: On-the-fly sensitivity adjustment and a 1600dpi sensor make this baby the mouse of all mice. Perfect for work, perfect for play.

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She Costs What?!

A dual-everything rig may not be cheap, but it will certainly last you for the next 12 months

CATEGORY	NAME	PRICE	URL
CPUS	Two AMD Opteron 275s	$1,350 each	www.amd.com
MOTHERBOARD	Tyan K8WE	$600	www.tyan.com
CASE	Silverstone TJ07	$350	www.silverstonetek.com
MEMORY	Eight 1GB Corsair DDR400 modules (registered)	$200 each	www.corsair.com
VIDEOCARDS	Two nVidia GeForce 7800 GTX	$600 each	www.nvidia.com
MONITORS	Two Dell 2405FPWs	$960 each	www.dell.com
POWER SUPPLY	PC Power and Cooling Turbo-Cool 850 SSI	$470	www.pcpowerandcooling.com
HARD DRIVES	Five Hitachi Deskstar 7K500 500GB drives	$500 each	www.hgst.com
RAID CONTROLLER	SATA Netcell Revolution	$300	www.netcell.com
OPTICAL DRIVES	Two Plextor PX-716SAs	$150 each	www.plextor.com
SOUNDCARD	Creative Labs Sound Blaster X-Fi	Unknown	www.creative.com
SPEAKERS	Logitech Z-5500	$400	www.logitech.com
KEYBOARD	Metadot Das Keyboard	$80	www.daskeyboard.com
MOUSE	Logitech MX518	$50	www.logitech.com
OSES	Windows XP Professional and Windows XP Professional x64 Edition	$400	www.microsoft.com
TOTAL COST		**$12,870**	

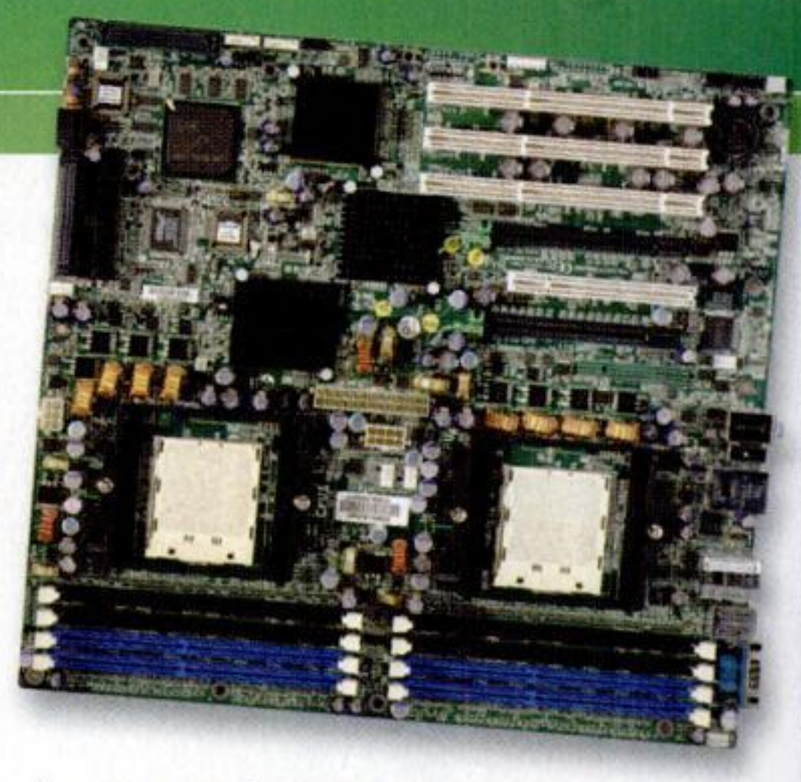
LOGITECH Z-5500 DIGITAL SPEAKERS: Whether we're using DMX to play games, watch movies, or listen to music, Logitech's Z-5500 Digital 5.1-channel speaker system delivers spine-tingling audio to our collective backside.

dmX

MOTHERBOARD

Tyan K8WE S2895

Dual-proc, dual-memory, and dual-videocard support. Praise be!



Once we decided on dual Opterons and dual videocards for DMX, we discovered the list of potential motherboards was short.

Short, yes, but the pickin's were sweet, as Tyan's K8WE hit all our requirements. This mobo is based on nVidia's new nForce4 Professional 2200 and 2050 chipsets. Dual core-logic chipsets? Yes, you read correctly. This board's got two separate chipset chips. Current consumer-level motherboards that support two videocards (that is, two nVidia cards in SLI mode, or two ATI cards using the ATI CrossFire scheme) provide only eight PCI-E channels to each card. This eight-channel limit is due to the fact that consumer motherboards boast only one core-logic chipset. *But* by employing two chipsets, the Tyan K8WE can dedicate a full x16 PCI-E slots to each graphics card for a total of 8GB/s of bandwidth per card! *That's 8GB/s per card!*

Dual Opteron mobos come in two configurations. The cheapskate config forces both processors to share a single bank of dual-channel RAM via the CPU's high-speed HyperTransport link. We'd never settle for such a half-assed approach. Then there's the hardcore approach used by the K8WE's config: Each dual-core processor gets its own dedicated bank of dual-channel DDR400 RAM, fostering maximum memory bandwidth for each CPU. This is practically a necessity for our dual-proc, dual-core rig, because sharing a single bank of memory between four cores would put a serious dent in memory bandwidth *and* overall system performance.

With videocards hogging both PCI-E slots, we were left with just three expansion slots. Fortunately, they were 64-bit PCI-X slots, so we could use either high-speed PCI-X peripherals or standard, old-school PCI cards.

This Tyan mobo also features native SATA support, gigabit Ethernet, a built-in hardware firewall, and really nifty surface-mounted buttons that let you power on, reset, and even clear the BIOS with a mere finger-push (perfect for open-case surgery). The K8WE even includes onboard Ultra 320 SCSI support. Because we weren't going to use it, we disabled the SCSI controller and also shut off the onboard audio.

Our only complaint about this beautiful motherboard? It's got just one parallel ATA port. But that's a pretty minor quibble for such a lust-worthy hunk of PCB.

CASE

Silverstone TJ07

The all-new TJ07 from Silverstone is a masterpiece. Not only is it beautiful enough to grace our magazine cover, it's ginormous enough to hold—and cool—all of DMX's hardware. In person, it's simply breathtaking.

The entire enclosure is made of aluminum, making it light yet sturdy enough to hold our massive battery of add-in parts. The case uses a reverse ATX design, with a separate chamber along the bottom for hard drives and the PSU. Each of the three-drive hard drive cages in the lower chamber sports a dedicated 12cm cooling fan. A pair of 12cm exhaust fans on top and two 9.2cm exhaust fans at the rear handle cooling for the upper chamber. It's a veritable smorgasbord of cooling!

Brrr… we're getting chilly just thinking about it!

MEMORY

Eight 1GB Sticks of Corsair DDR400 Registered

In 1996, we used 32MB of RAM in our very first Dream Machine. Today, we're up to 8GB, and that's not even going overboard. After all, our mobo supports up to 16GB of memory!

The workstation/server-oriented Opterons feature an on-die memory controller, so we were forced to use the specific registered memory that works with the controller. But, hey, this registered stuff is dual-channel DDR, so please add another notch to our dual-everything belt, thank you very much.

Unlike garden-variety memory, registered memory boasts an extra chip on each module to verify the integrity of memory signals. (And, in fact, the reliability factor of registered memory is actually handy when you're doing something really silly, like stuffing 16GB worth of modules into a motherboard.) While our K8WE can support 16GB of RAM, we opted for "just" 8GB—that's 4GB per processor—because we think it's the right balance of capacity and utility. After all, the rig's main OS is Windows XP Professional x64 Edition, not some top-secret OS developed by the National Security Agency.

As a 64-bit OS, WinXP x64 Edition can take full advantage of 4GB of memory per CPU (albeit only in the special x64 versions of various applications). In order to run consumer-level benchmarks, we also installed the 32-bit version of Windows XP Professional, but we suspect a lot of our mouse jockeying will be done from within the 64-bit environment.

More hardware on page 30

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Winner, Best RPG of E3
– Game Critics Award, GameSpot, IGN, GameSpy, Xbox Evolved, Console Gold, Daily Game, Games Domain
"One look at Oblivion will shatter your conceptions about what is possible in a video game."
– GameInformer
"The biggest title for the Xbox 360™, and the one I'm most looking forward to."
– GamePro Magazine
"Oblivion is, at this time, the best-looking game I have ever seen in my life."
– Xbox.com
"To call the graphics 'amazing' is an extraordinary understatement."
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dmX

MONITORS

Two Dell 2405FPWs

With an unprecedented widescreen expanse of 24-inches, just one of these babies is extreme, but the DMX is all about excess, and you get that in spades when you pair up two of Dell's 2405FPWs. We're talking about screen as far as the eye can see. In tandem, the two 1920x1200-resolution screens offer more than enough room for all manner of multitasking—you can view multiple documents or web pages at full size, side-by-side-by-side, no prob, *and* simultaneously treat yourself to the cinematic splendor of DVDs and games, with full-screen action up front and in your face. Talk about immersive!

Add to that a host of unexpected extras, such as picture-in-picture functionality, a built-in 9-in-1 media reader, and four USB 2.0 ports, *per screen*, and you can see why we consider these 2405FPWs so, well, Dreamy. See page 72 of this issue for a full review.

POWER SUPPLY

PC Power and Cooling Turbo-Cool 850 SSI

Put away your puny 400-watt power supply and send that 500-watt unit packin'. This year's Dream Machine consumes 300 watts just idling in its staging area, and pushes past 400 watts when hitting all four CPU cores. Fire up a game on DMX's two GeForce 7800 GTX boards, and you'll easily push past 450 watts.

Now, wouldn't these power requirements demand a PSU in the neighborhood of 550 or 600 watts? No. As you know, consistently running a power supply at 90 percent of its capacity guarantees a very short PSU lifespan. Furthermore, when summer rolls around and ambient room temperatures hit 85-plus, your 550-watt power supply will be putting out the power of a 400-watt jobbie. That's a recipe for grid failure.

With PC Power and Cooling's 850-watt Turbo-Cool 850 SSI, we have more than enough power to keep our rig running—no matter how hot it gets inside. Sure, DMX may not be running *dual* power supplies, but the Turbo Cool 850 delivers just as much power as two lesser units.

VIDEOCARDS

Two nVidia GeForce 7800 GTXs in SLI

Heating up gameplay while cooling down core temps

The kids at nVidia made our videocard choice easy: They introduced a brand-new 3D powerhouse—the GeForce 7800 GTX—just as we were finalizing the Dream Machine's config. And we're not spewing hyperbole, folks. Powerhouse is *not* too strong a word to describe the new nVidia chip, especially when you marry two of these GPUs in SLI mode.

The 7800 GTX boasts 24 pixel pipelines and features a staggering 302-million transistors. nVidia's previous-best card, the GeForce 6800 Ultra, includes just 16 pixel pipes, and about 100 million fewer transistors.

Aside from the increased transistor and pipeline counts, the 7800 GTX doesn't look drastically different from the 6800 Ultra on paper. However, nVidia says the new chip also gets a significant performance boost from increased parallelism (meaning more instructions can be executed simultaneously) and increased arithmetic density (meaning more calculations can be performed simultaneously).

Despite its immense processing power, and despite the fact that the 7800 GTX chip is manufactured using a 110 nanometer process (a modest die shrink from the 6800's 130nm process), the reference-design boards we obtained consume only one motherboard slot per board. That's right: Large, unseemly, slot-occupying coolers aren't necessary for these videocards. For this, we can partly thank the 7800's integrated power management features, which disable unused sections of the chip. nVidia clocked each card's GPU at 430MHz, a modest bump from the 6800 Ultra's 425MHz. But, hey, we're talking one-slot cards here, folks, and for this we're thankful.

Because the final iterations of ATI's and nVidia's previous-generation cards included 512MB of memory, we expected to see similar memory amounts in each company's next-gen cards. But the two 7800 GTX boards we received are outfitted with just 256MB of graphics memory (DDR3 clocked at 600MHz with a 256-bit interface). Because the 512MB ATI and nVidia boards we've tested failed to deliver any perceptible performance boosts over their 256MB siblings, we're not chagrined by the 7800 GTX's "small" 256MB frame buffer. We just don't see the need for larger frame buffers until more next-gen games ship.

So, what kind of performance can you expect from $1,200 worth of videocard madness? In DMX, the GeForce 7800 GTXs ran *Doom 3's* demo1 at a buttery-smooth 86.4fps (high-quality mode at 1600x1200, 4x antialiasing, and 4x anisotropic filtering). We obtained even more impressive benchmark results with Futuremark's *3DMark05.* With Game 3 set to 1280x1024 resolution, 4x AA, and 4x aniso, this year's Dream Machine kicked out 48.2fps—a 65 percent boost over our zero-point system. Yowza!

More hardware on page 32

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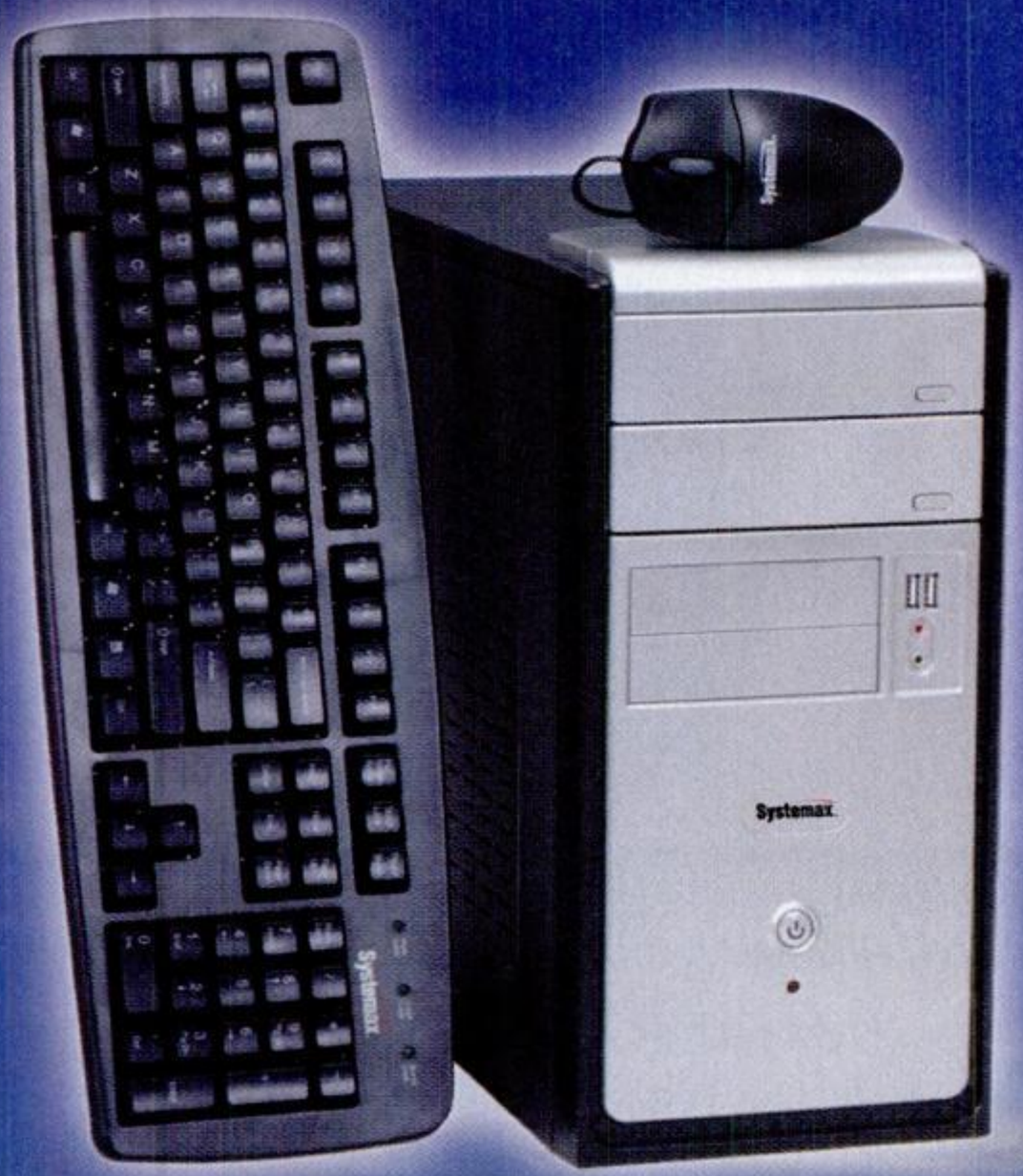
Systemax™

Systemax recommends
Microsoft® Windows® XP Professional

Do More With More.

Get more, do more, and enjoy more with a Systemax Venture HU² PC featuring the Intel® Pentium® D Processor, thanks to new dual-core processing. Two full processing cores mean an extra powerful gear when you need it so you can accomplish more while running multiple demanding programs, such as editing video while downloading music.



Venture HU²

- Intel® Pentium® D Processor 820 with Dual Core Technology 2.8GHz, 800MHz FSB, 2 x 1MB Cache
- Microsoft® Windows® XP Professional x64
- Intel D945P Motherboard
- 512MB PC4200 DDR2 Memory
- 80GB SATA 7200RPM Hard Drive
- 52X/32X/52X CD-RW Drive
- 6 USB 2.0 (2 Front)
- ATI X300SE Pro 128MB PCI Express
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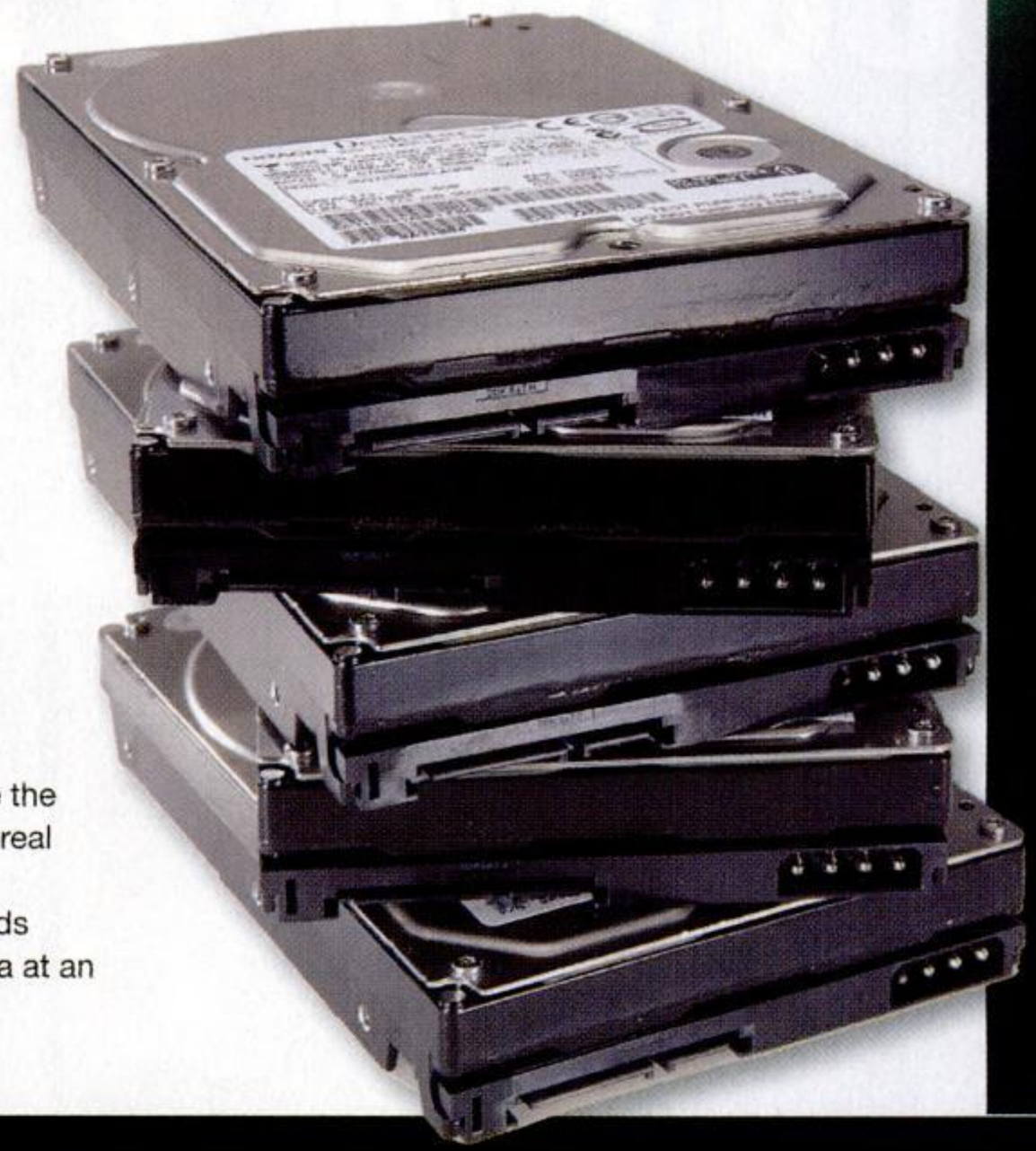
HARD DRIVES

Five Hitachi Deskstar 7K500s

Dual terabytes (well, almost) of storage!



Though we're certainly proud of the Dream Machine's next-gen videocards, dual-core CPUs, and other bits of "top-secret" hardware, we're particularly stoked that we were able to secure *five* 7K500 megadrives at a time when even large system vendors can't snake more than one or two from Hitachi. As we stated in our July review of the 7K500, it's not quite the fastest drive in captivity, but it's by far the most spacious at 500GB. And because the Dream Machine is all about "dual everything," we decided to go for dual terabytes via a monstrous RAID 3 array. This level of RAID takes RAID 0's high-speed striping scheme, and adds "parity" bits, providing complete data security in case a drive fails.

Now, if you want to get all technical on us, we'll concede that the formatted capacity of our array is actually 1.86TB. Part of the shortfall is due to the discrepancy between how Windows and the drive manufactures quote storage capacities, but we also lost one drive's space to parity bit storage. Still, 2TB or not, we felt it was best to take the safe approach, as RAID 0 provides no data redundancy, and it'd be a real bitch to lose 2TB of, ahem, "multimedia" files.

While today's fastest hard drives throw down average read speeds of 60MB/s, our five-drive array almost *triples* that feat by guzzling data at an astounding 170MB/s on average.

RAID CONTROLLER

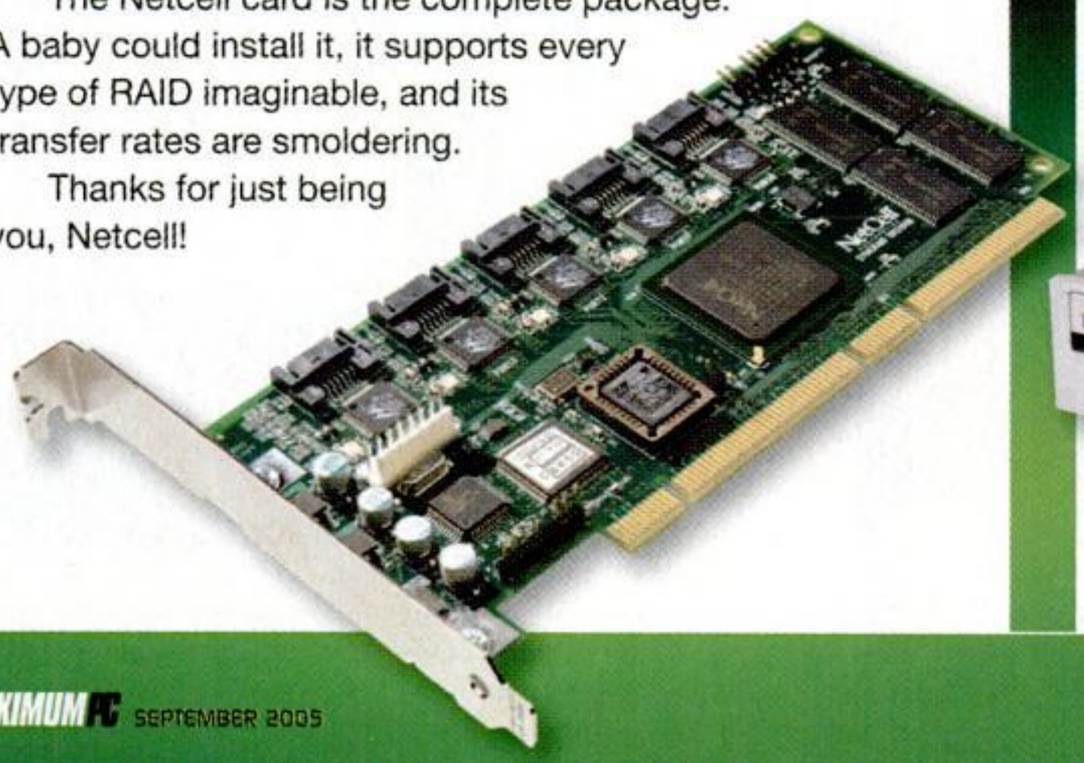
SATA Netcell Revolution

Netcell's new five-port PCI-X SATA RAID controller got our RAID 3 array up and running without any driver installation whatsoever. You read that right: During the Windows install, the Netcell card looks like an ATAPI device to the OS, so Windows sees the array and installs itself on it without any F6 drivers at all!

We set the card to run our array in RAID 3, which features byte-level striping similar to RAID 5, and provides the performance of RAID 0 (striping) with the protection of RAID 1 (mirroring). The card's 64-bit PCI-X interface provides better bandwidth than traditional PCI-based RAID controllers, and this was backed up during testing with phenomenal benchmark numbers.

The Netcell card is the complete package. A baby could install it, it supports every type of RAID imaginable, and its transfer rates are smoldering.

Thanks for just being you, Netcell!



OPTICAL DRIVES

Two Plextor PX-716SAs

The Plextor PX-716SA CD/DVD burner doesn't just beat its competitors—it drops them in a blender and pounds the frappé button. No other optical drive can touch its raw speed. Try burning 8.5GB of data to a double-layer DVD at a blistering 6x! We're talking 8.5GB of data in just 18 minutes! And that's just for starters. The 716SA is also a benchmark buster in single-layer burning (4.25GB in just under six minutes), and offers record-breaking speeds for rewriteable DVDs as well. And because the PX-716SA uses the SATA interface, we didn't even have to double up our dual drives on our mobo's single parallel ATA port.

When we reviewed it, we called the previous-generation Plextor IDE PX-716A "the finest optical drive we've ever held in our hot little hands." The company's updated SATA PX-716SA version takes the best and makes it even better, so what could we do other than up the ante with *two* drives for disc-to-disc copying?

More hardware on page 34

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DMX vs. the Benchmarks

Fast today, even faster tomorrow

When you build a machine for tomorrow, you can't always expect record-breaking performance today. To wit, the majority of today's apps are single-threaded and rarely stress the potential of dual-processor systems, let alone our dual-core, dual-processor Dream Machine. In this regard, DMX's benchmark results may be a letdown for anyone expecting a nose-snorting, muscle-bulging, Ben Grimm-style "clobbering time!" from our hand-built, dual-everything rig.

In our Divx video-encoding test, for example, our machine's extra CPU cores seemed to lay idle. As you can see from the chart on this page, our Lab's current zero-point machine—armed with a higher-clocked, single-core CPU (namely the AMD FX-55)—squeezed by DMX with a 13.38 percent performance advantage.

The oddest result we saw was in our *Premiere Pro* test. Ever since Adobe rewrote this app's code, the video-editing software has favored the Pentium 4 architecture over the short-pipeline architectures of the Athlon 64 and Pentium M chips. So, while we figured our Dream Machine would lose to P4-powered rigs in *Premiere Pro*, we didn't expect it to lose to our zero-point rig, because *Premiere Pro* is multi-threaded (and thus should benefit from both dual-core and dual-processor hardware). But lose it did.

This ugly turn of events had us scratching our heads. Could it be possible that apps like *Premiere Pro*, optimized for Pentium 4 Hyper-Threading, run like dog turds on true multi-core AMD processors? To check our theory, we ran *Fine Reader 7 Pro*, a multi-threaded OCR application from Abbyy that runs like wildfire on dual-core Pentium EE CPUs with Hyper-Threading enabled.

Shockingly, *Fine Reader 7 Pro* was slower on our quad-core DMX creation than on a dual-core Athlon 64 X2 4800+ machine. As the test was running, we pulled up Task Manager and discovered that the OCR program was rarely spawning more than a few threads. For the most part it was like watching the performance of a single-core 2.2GHz processor. Drat! Another multi-threaded app that doesn't gel with our quad-core rig.

Our head-scratching now turned into hair-pulling. Were we just too far ahead of the technology curve? To run a sanity check, we fired up *DVD Shrink*—a multi-threaded, freeware MPEG-2 encoder—to see if its multi-threading would provide some redemption.

In past DVD Shrink tests, the PEE 840 chip ruled the roost, transcoding our test video in about 8 minutes, 5 seconds. Could DMX's quad-core setup beat this time? It could, and it did. DMX's four cores spit out the same video in 5 minutes and 26 seconds.

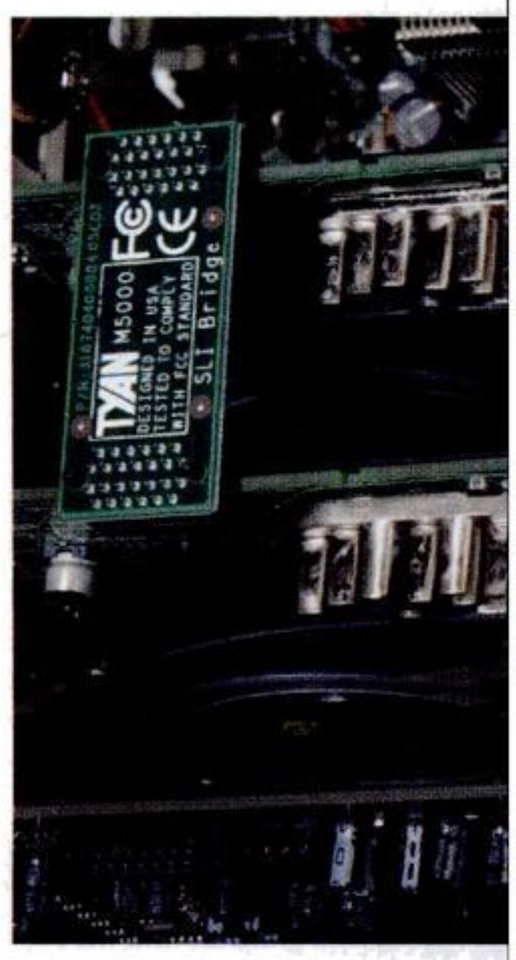
Now, that's what we're talkin' 'bout! A 49 percent performance boost!

We also ran Ahead's *Nero Recode* to convert the same MPEG-2 video to a PSP-compatible MPEG-4 format. The reigning CPU champ in this benchmark has been the dual-core Athlon 64 X2 4800+, which takes 20 minutes to transcode the movie. By comparison, a dual-core, Hyper-Threaded PEE 840 takes 24 minutes. When we threw the test at DMX, it completed it in 16 minutes and 30 seconds—21 percent faster than the X2, and 45 percent faster than the 840. Woohoo! Take that you dual-core weaklings!

The heart of our 8.8GHz system is a pair of dual-core AMD Opteron 275 CPUs clocking along at 2.2GHz.

WORLD-CLASS PERFORMANCE: REDEFINED

Of course, with a pair of just-minted GeForce 7800 GTX cards, DMX broke gaming records too, hitting 85.4fps in *Doom 3* at 1600x1200 with 4x AA and 4x anisotropic filtering flipped on. This represents about a 7 percent performance increase over Falcon Northwest's latest Mach V rig, which runs a single 4.25GHz P4 and two 512MB GeForce 6800 Ultra cards.

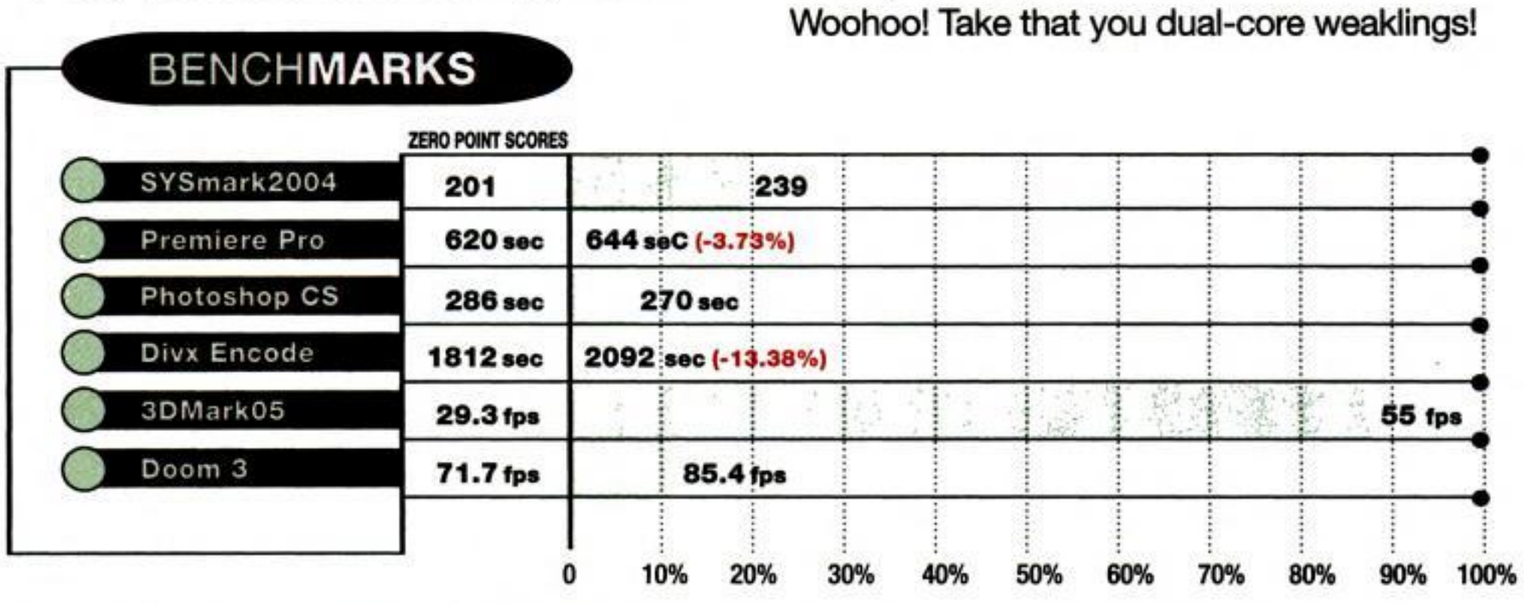


In *3DMark05*, our rig's two 7800 GTX cards turned in an 88 percent increase over our zero-point's FX-55/GeForce 6800 Ultra combo. Mind you, our zero-point system doesn't run just a single 6800 Ultra card. It runs two 6800s in SLI mode. The record in *3DMark05* was also held by the Falcon Mach V until our DMX muscled past it.

DMX impressed us again in the *SYSmark 2004* test suite, knocking out a whopping average score of 239, which is faster than any default-clocked system we've tested. (The aforementioned Falcon Northwest machine hit a score of 247, but its single P4 was overclocked to a scary-fast 4.25GHZ.)

Digging into *SYSmark 2004's* detailed test results, we found that DMX actually performed much better than its overall score of 239 would suggest. It turns out

BENCHMARKS



Our zero-point reference systems uses a 2.6GHz Athlon 64 FX-55, 2GB of DDR400 Crucial Ballistix RAM, two nVidia GeForce 6800 Ultra cards in SLI, a Maxtor 250GB DiamondMax10, a Sound Blaster Audigy 2 ZS, a PC Power and Cooling TurboCool 510 Deluxe Express, and Windows XP Pro with SP2.

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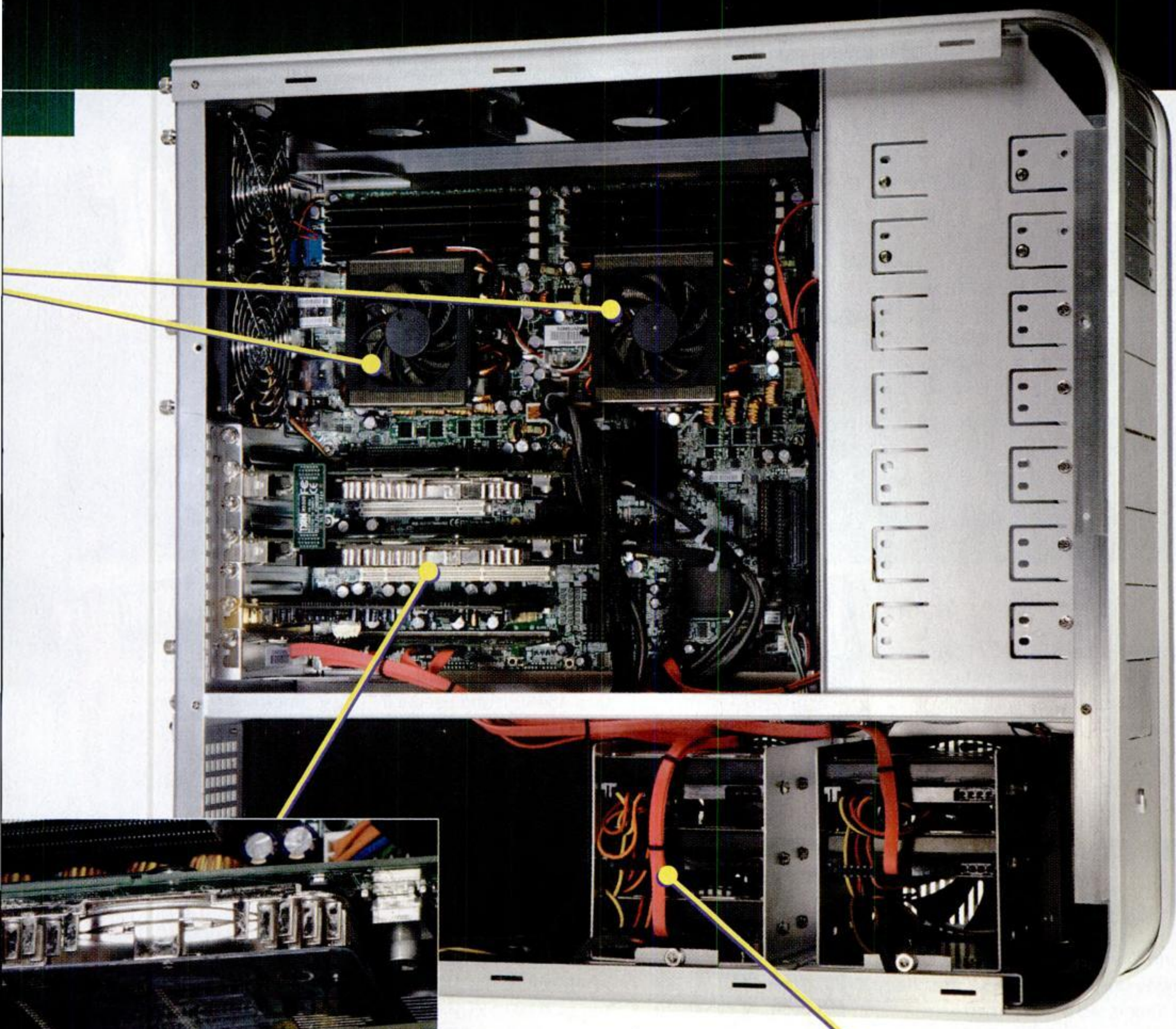
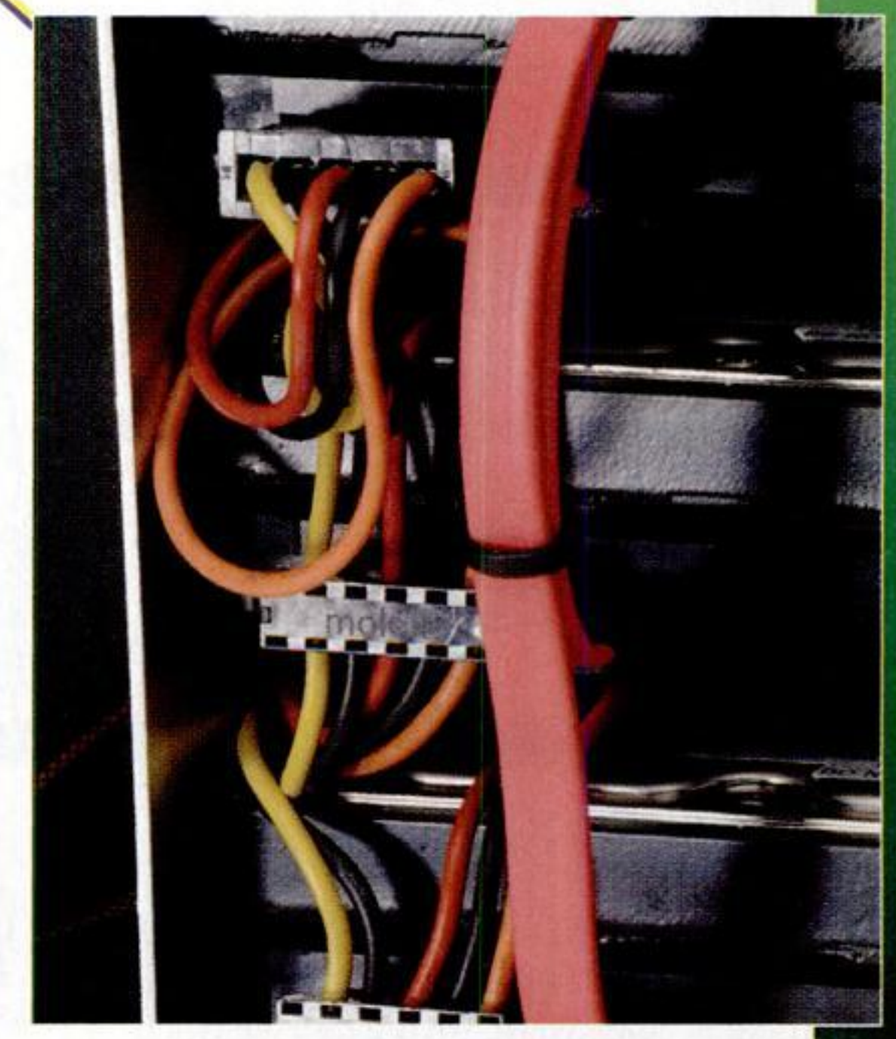


Just a single GeForce 7800 GTX would make a boy happy. So we snaked a pair and ran them in SLI mode to make a boy very happy.

that the rig's poor showing in the *3ds max* portion of the test suite had an ugly effect on the machine's overall average. Autodesk's multi-threaded 3D-rendering program should scream on a four-core machine, and we suspect that our OS was to blame—*3ds max* just doesn't do well on multi-processor systems running WinXP. For what it's worth, we saw similarly wonky benchmark performance when benching the dual-core, Hyper-Threaded Pentium Extreme Edition 840 in June.

So what's our final take on dual-everything performance? Well, in single-threaded apps, DMX isn't "bad," as only the fastest single-core machines can ace us with their raw CPU clock-speed advantage. Meanwhile, in truly multi-threaded apps, DMX displays the performance we expected: damn frickin' fast. And that's all without factoring in real-world, power-user-style multitasking. At one point during testing, we ran a game server, transcoded a DVD, played a game, and crunched units for Folding@Home all at the same time, and DMX never broke a sweat.

The icing on the cake is that performance will only improve as software code is updated to support Intel's and AMD's multi-core initiatives. Hopefully, the software developers are up to the task, because it'll take tightly written software for multi-core processors to shine. But regardless of what happens, DMX is ready for today's computing challenges, and is as future-proof as a machine can be.



Five Hitachi 7K500 drives give us nearly two terabytes of storage (plus the safety of redundancy!). Our Netcell RAID card was an utter joy during RAID setup.

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10 Dreams, 10 Machines

It's amazing how far we've come. Today's graphics cards pack eight times more memory than the original Dream Machine had for system RAM. And DM I's single 2GB drive has ballooned into a five-disk 2TB RAID array today. Boy, have we come a long way.

Heck, we've even undergone a complete name change. You'll notice that our first two Dream Machines fell under the rubric of *boot* magazine, the predecessor to *Maximum PC,* which celebrated its inaugural issue in 1998.

DM '96

From a time before 3D accelerators, the original Dream Machine, circa 1996, sported a 200MHz Pentium 1 CPU, 32MB of EDO RAM, and a 2GB SCSI hard drive. To think this was once dream-worthy.

PURE PC POWER
boot
DREAM MACHINE
We'll Show You How To Build Your Own Perfect $5K PC
Over 40 Hardware and Software Releases Previewed and Reviewed
01

DM '97

Running at 300MHz with 512KB of closely coupled L2 cache on the Pentium II processor, our second Dream Machine was far faster than the original. We doubled the capacity of the RAM and hard drive, to 64MB and 4.2GB, respectively. This was our first DM to sport a 3D accelerator.

DM '98

Hardly content with the fastest available Pentium II, we overclocked our 400MHz CPU to 450MHz and used it in a dual-proc-capable motherboard. Once again, we doubled our main memory and storage to 128MB of RAM and a 9GB hard drive.

DM '99

For our fourth Dream creation, we showed readers how to build their own PC. Despite the tutorial theme, we pushed hardware boundaries. We upped storage to 18GB and included a high-speed-at-the-time Matrox 3D accelerator with a 32MB frame buffer.

DM '00

The year 2000 brought the first dual-proc Dream Machine. Its pair of 1GHz Pentium III CPUs, 512MB of RDRAM, and 75GB hard drive were best in class at the time, and its price tag set a record: $11,987.

DM '01

Instead of just one Dream Machine, we built three in 2001! Our gaming rig included a Pentium 4 overclocked to 2GHz, the workstation machine featured dual 1.2GHz Athlon MP CPUs, and the entertainment center config featured a cool and quiet Pentium III.

DM '02

The 2002 Dream Machine ushered in the era of modern programmable shader-powered videocards. In addition to an overclocked P4 running at 2.85GHz and 512MB of Rambus memory, DM '02 sported an early model Radeon 9700. Two 120GB hard drives in RAID rounded out the package.

DM '03

Water-cooling helped bring Dream Machine VIII's 3.2GHz Pentium 4 to a reliable 3.53GHz clock. Meanwhile, we ditched the dying Rambus technology for a whopping gig of DDR400 memory. We paired two 250GB drives and two 10,000rpm Raptors for the perfect balance of speed and capacity.

DM '04

We fired the last shot in the CPU megahertz wars with a single 3.6GHz Pentium 4 overclocked to 4GHz. Once again, our system memory doubled to hit 2GB, while storage capacity remained about the same with two 300GB drives and two Raptors.

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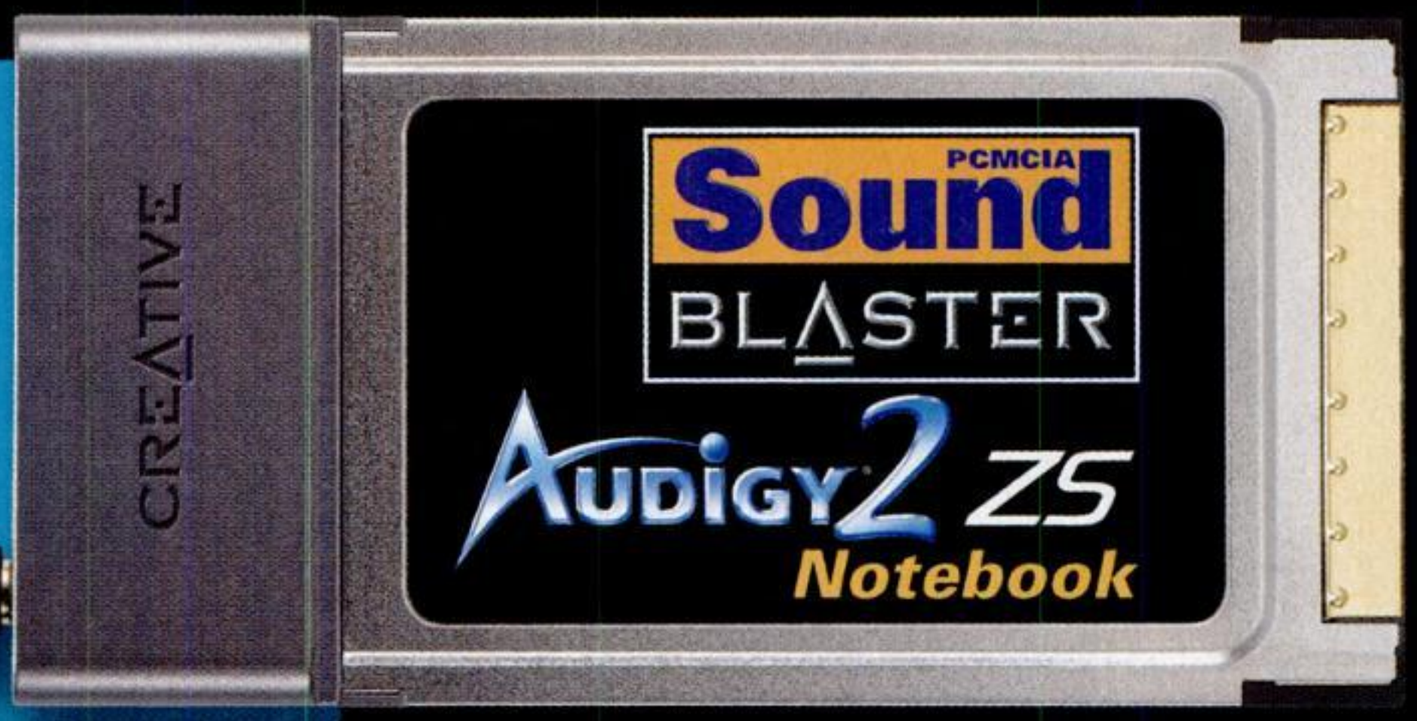

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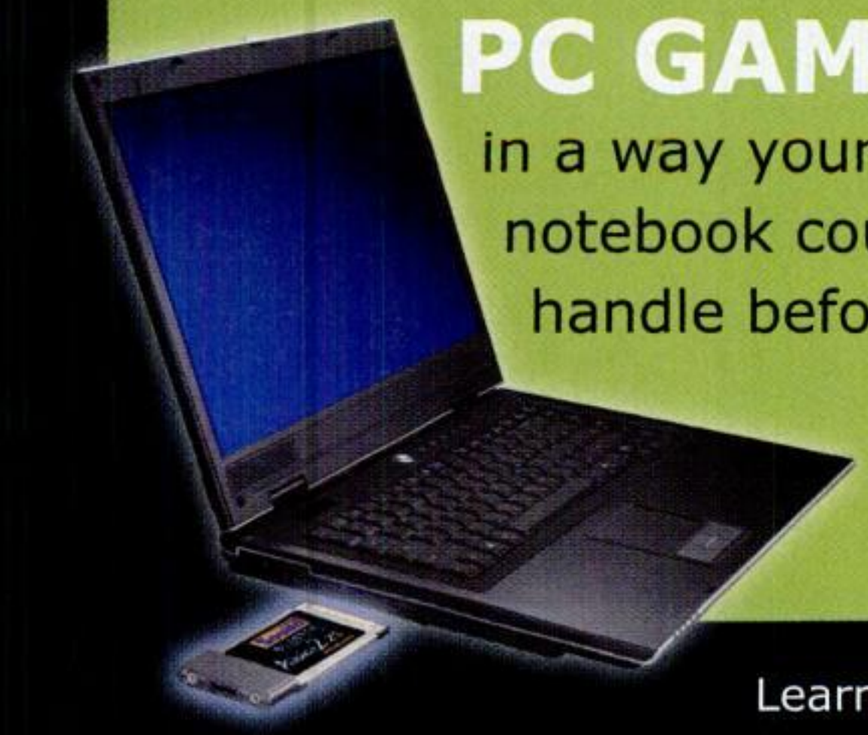

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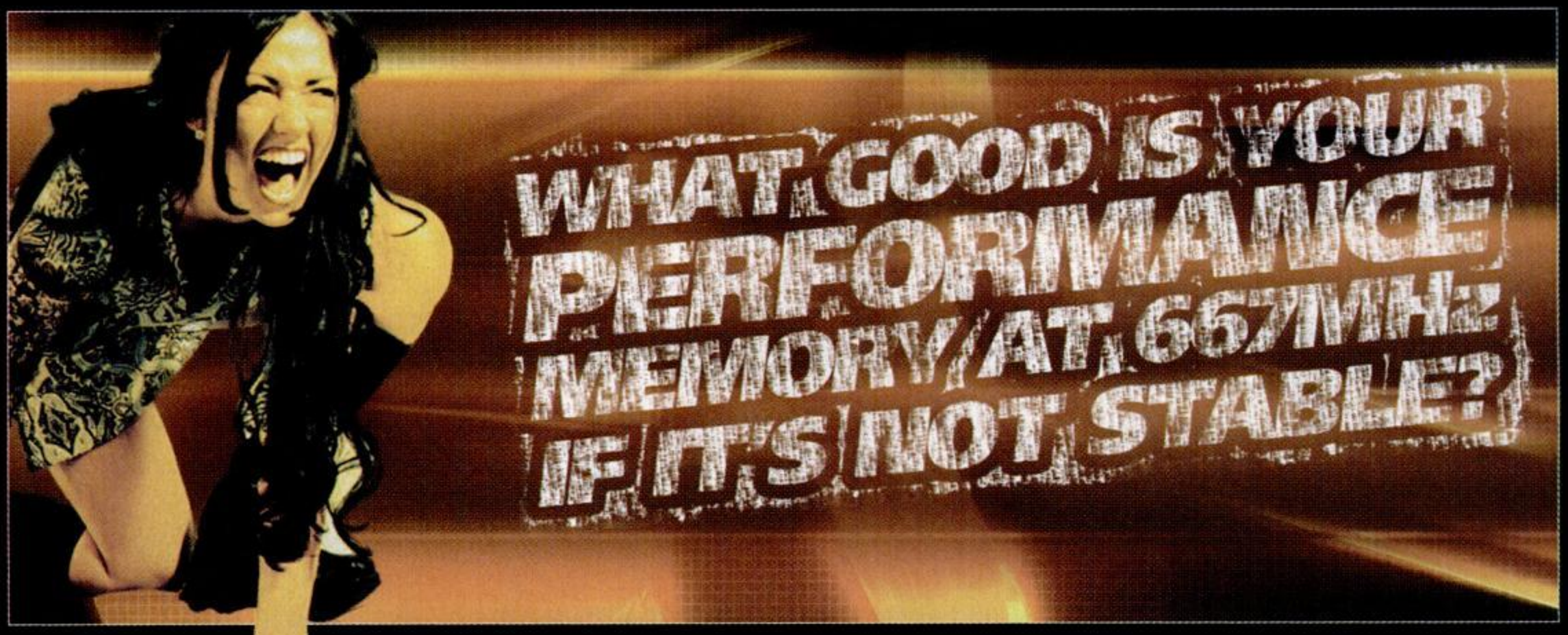

Crucial Ballistix™ memory delivers the performance and stability that will leave your LAN party buddies eating your dust!

Memory is memory, right? Inferior performance memory can wreak havoc on your system. It can lead to software crashes, driver and operating system hiccups, and all sorts of trouble you just can't tolerate. As an enthusiast, you need memory that consistently meets the performance demands of your system.

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—SharkyExtreme.com
March 2005

"Shod in their metallic-gold heat spreaders, Crucial's premium memory line pulled in the top default speed score in 3DMark 2005...Ballistix can hold its own in synthetic tests and real-world performance...The Ballistix won top honors with Doom 3™ in our 10% overclock test...the modules sport average pricing with above-average test scores..."

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5 IDEAS MICROSOFT SHOULD STEAL

Innovate, or at least appropriate. That's the advice we have for the folks in Redmond as Longhorn gets spiffed up for its debut—here are five features of other OSes we'd like to see in Windows

BY ROBERT STROHMEYER

BY MARK MADEO

Everything is derivative. All operating systems build on ideas and concepts taken from technologies that came before. Xerox PARC based its graphical user interface, called WIMP (for windows, icons, menus, and pointers), on Douglas Engelbart's invention of the mouse at Stanford Research Institute. Apple stole from Xerox PARC the idea (and several key developers) for its Mac OS. DESQview, GEM, AmigaOS, and Windows all built on—and banked on—the popularity of the Mac OS. IBM's OS2, the X Windows interface for Unix and Linux, NeXTSTEP, and BeOS, made innovations that pushed Microsoft to recreate Windows, and Apple to go back to the drawing board for OS X.

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5 IDEAS MICROSOFT SHOULD STEAL

Indeed, evolution never ends, and Microsoft stands on the verge of what everyone hopes will be yet another major advance with its successor to Windows XP—Longhorn. From what we've seen so far, Longhorn will undoubtedly change the world of Windows forever.

And though our hopes are high, we know better than to expect perfection. Here are five innovations from other OSes that we'd like to see Microsoft include in Longhorn, or, failing that, some future OS.

Better Application Management

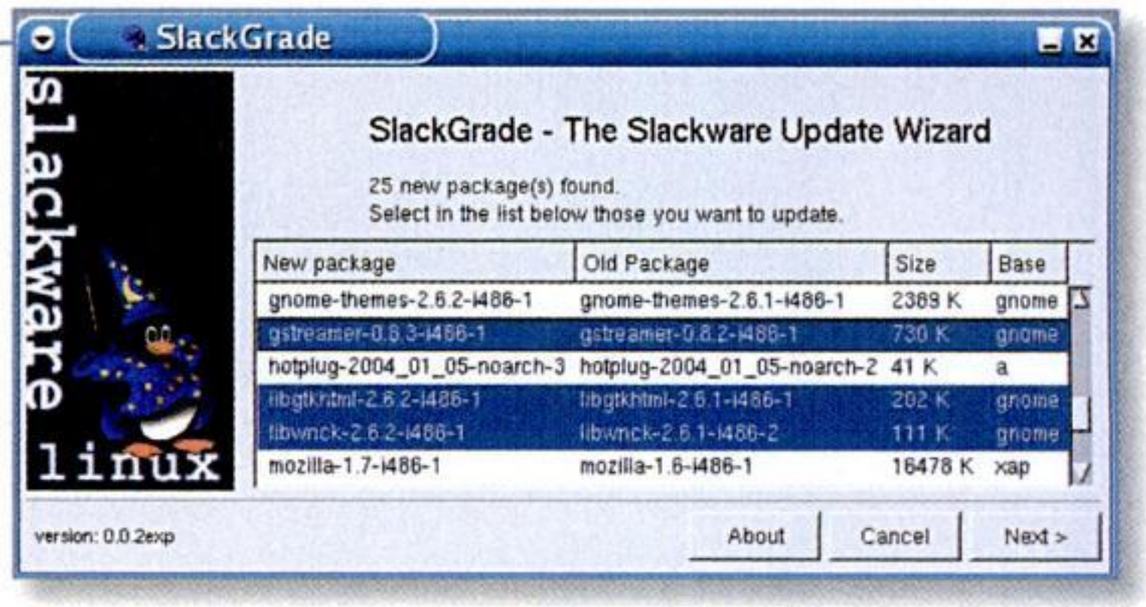
Install routines are a drag. They spread detritus all over your hard drive that you can never really get rid of without a time-consuming fresh installation of Windows XP. And in spite of—nay, because of—the Add/Remove Programs Wizard, this problem gets worse with every Windows iteration. Every program released for Windows packs more shared DLLs than those that came before it, cramming the crevices of your hard drive with useless files you'll never be able to track down. Longhorn had better do something to save us from DLL hell, or we're all in for another decade of pain and misery.

Who does it right?

Just about every other modern operating system does a better job of managing application installs than Microsoft's OS. Many Linux distributions come with package-management utilities that keep track of every file installed on your drive. This is something the Add/Remove Programs Wizard is supposed to do, but doesn't. But, hey, the fact that a bunch of unpaid developers can produce working solutions in their spare time offers a glimmer of hope for the rest of us.

Meanwhile, the Macintosh has pretty much always done a better job of application management than Windows has—doubly so, in OS X. Installing a new program—even a suite as massive as *Microsoft Office*—is as easy as dragging a single icon or folder from the CD to your Applications folder. Because the programs are self-contained, uninstalling is as simple as a quick drag to the trash can.

While Linux and Mac OS X take different approaches to the same problem, both work reasonably well. More importantly, both are demonstrably better than Windows XP. The object-oriented Avalon app framework in Longhorn should simplify the problem dramatically, but we'll believe it when we see it. After all, support for your legacy apps and the DLLs they rely on will probably continue to pollute our PCs with kruft.


SlackGrade
SlackGrade - The Slackware Update Wizard
25 new package(s) found.
Select in the list below those you want to update.
New package | Old Package | Size | Base
gnome-themes-2.6.2-i486-1 | gnome-themes-2.6.1-i486-1 | 2389 K | gnome
gstreamer-0.8.3-i486-1 | gstreamer-0.8.2-i486-1 | 730 K | gnome
hotplug-2004_01_05-noarch-3 | hotplug-2004_01_05-noarch-2 | 41 K | a
libgtkhtml-2.6.2-i486-1 | libgtkhtml-2.6.1-i486-1 | 202 K | gnome
libwnck-2.6.2-i486-1 | libwnck-2.6.1-i486-1 | 111 K | gnome
mozilla-1.7-i486-1 | mozilla-1.6-i486-1 | 16478 K | xap
version: 0.0.2exp
About
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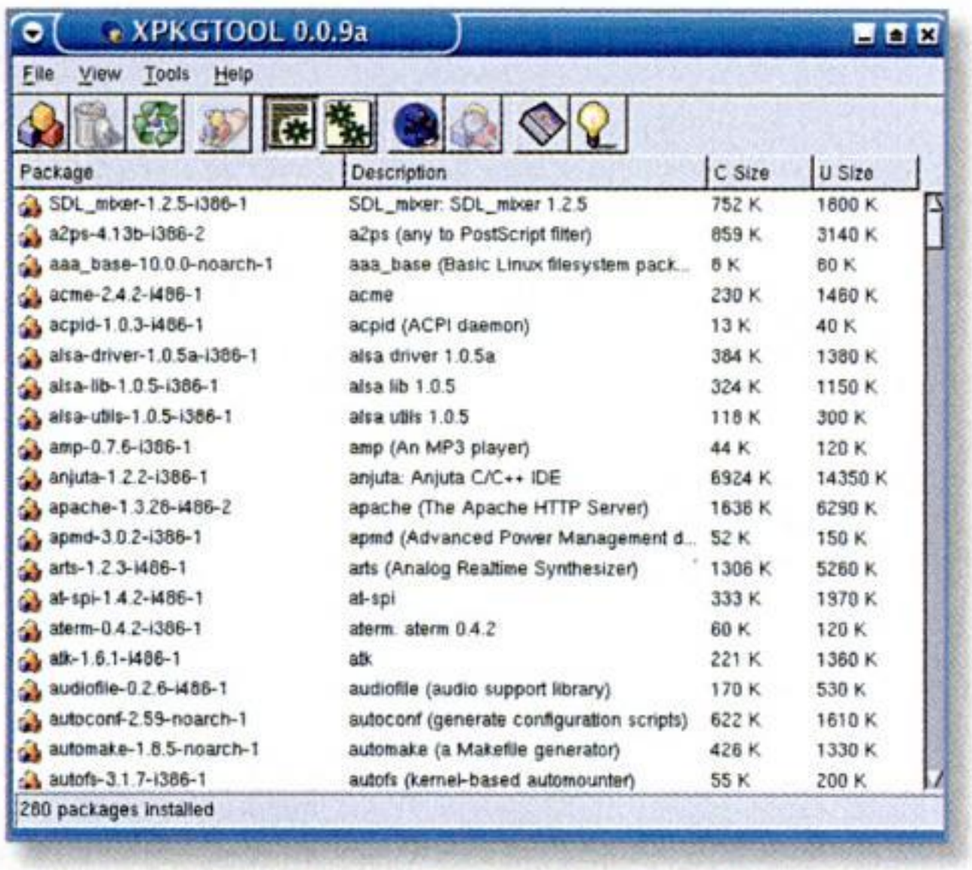
Next >

***SlackGrade* is an awesome Linux tool that shows you what updates are available for all the packages on your system. Hey, Bill, are you listening?**

It's different but good. Each file in OS X's Applications folder is a container that holds everything the app requires.


XPKGTOOL 0.0.9a
File View Tools Help
Package | Description | C Size | U Size
SDL_mixer-1.2.5-i386-1 | SDL_mixer: SDL_mixer 1.2.5 | 752 K | 1600 K
a2ps-4.13b-i386-2 | a2ps (any to PostScript filter) | 859 K | 3140 K
aaa_base-10.0.0-noarch-1 | aaa_base (Basic Linux filesystem pack... | 6 K | 60 K
acme-2.4.2-i486-1 | acme | 230 K | 1460 K
acpid-1.0.3-i486-1 | acpid (ACPI daemon) | 13 K | 40 K
alsa-driver-1.0.5a-i386-1 | alsa driver 1.0.5a | 384 K | 1380 K
alsa-lib-1.0.5-i386-1 | alsa lib 1.0.5 | 324 K | 1150 K
alsa-utils-1.0.5-i386-1 | alsa utils 1.0.5 | 118 K | 300 K
amp-0.7.6-i386-1 | amp (An MP3 player) | 44 K | 120 K
anjuta-1.2.2-i386-1 | anjuta: Anjuta C/C++ IDE | 6924 K | 14350 K
apache-1.3.26-i486-2 | apache (The Apache HTTP Server) | 1636 K | 6290 K
apmd-3.0.2-i386-1 | apmd (Advanced Power Management d... | 52 K | 150 K
arts-1.2.3-i486-1 | arts (Analog Realtime Synthesizer) | 1306 K | 5260 K
at-spi-1.4.2-i486-1 | at-spi | 333 K | 1970 K
aterm-0.4.2-i386-1 | aterm: aterm 0.4.2 | 60 K | 120 K
atk-1.6.1-i486-1 | atk | 221 K | 1360 K
audiofile-0.2.6-i486-1 | audiofile (audio support library) | 170 K | 530 K
autoconf-2.59-noarch-1 | autoconf (generate configuration scripts) | 622 K | 1610 K
automake-1.8.5-noarch-1 | automake (a Makefile generator) | 426 K | 1330 K
autofs-3.1.7-i386-1 | autofs (kernel-based automounter) | 55 K | 200 K
280 packages installed

Linux package managers, such as *XPKGTOOL*, show you every application on your hard drive, sorted by type, and include useful descriptions that help you to take control of your files. This is a huge improvement over the chaotic mess of orphaned DLL files that Windows users are accustomed to.

Quick Views of Open Windows

Windows users enjoyed true pre-emptive multitasking long before our Mac brethren, but our ability to launch and work in multiple active applications has been eclipsed by the paralyzing challenge of switching back and forth between multiple windows to find the right pane. Sure, it's easy enough with two or three windows, but when you reach five or more, it's a major pain. Over a lifetime, you'll waste weeks clicking and clicking again on wrong windows. Windows XP's puny taskbar does little to help you once there are a dozen or more tiny title boxes crammed on there. What exactly is "Micr... doc" supposed to mean, anyway?

Who does it right?

Mac OS X's Exposé gives you a one-tap glance at all your open windows, or scoots them all aside to give you a clear

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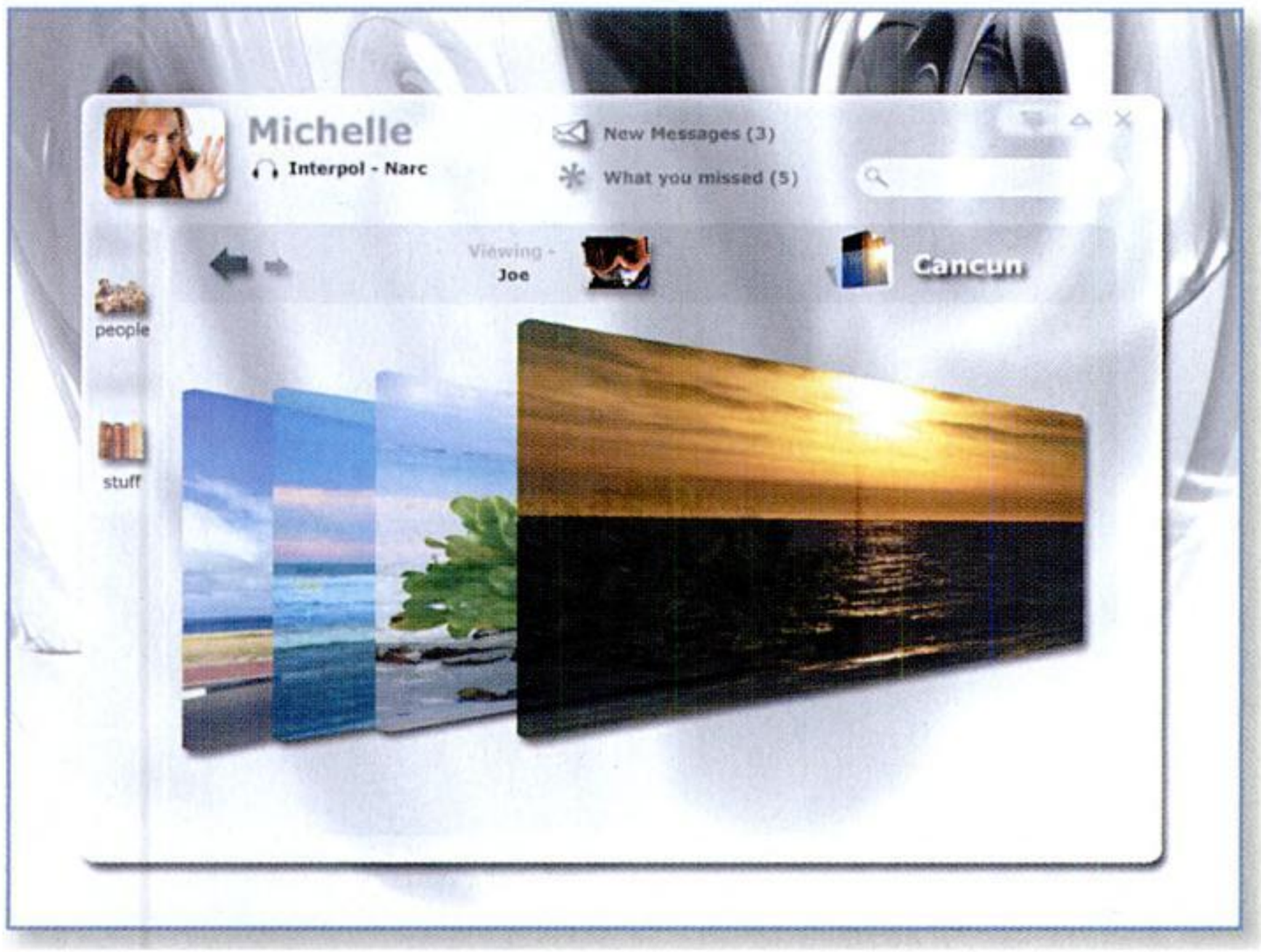

This screenshot from an alpha Longhorn application demonstrates Longhorn's 3D window management. We'd like to see this combined with something like Mac OS X's Exposé to make quick views even easier to navigate.

view of your desktop. Whether you've got two windows open or 20, the same simple routine gives you a glance at the big picture. You just hit the F9 key and all of your windows automatically scale down to give you a view of everything you're doing. If you're still not sure what's going on in a window, a quick hover of the mouse will tell you, providing details such as the name of the file open in a particular window or the number of unread messages in your inbox. When you spot the window you're looking for, just click it once to bring it to the front. Alternately, you can use the F10 key to drop a shadow around your active window for easier reading, or use F11 to slide all of your windows aside for easy desktop access.

By all rights, Longhorn ought to ship with a feature that improves on Exposé's functionality; after all, the upcoming OS is capable of handling windows, images, and other objects as accelerated vector objects. We'd like to see this feature put to use for quick views, letting a function key or mouse gesture turn all the windows askew, for instance, to make the process of finding what you're looking for onscreen a little more intuitive. If Microsoft fails on this count, we'll be miffed.

3D Acceleration Spanning Multiple Monitors

Now that we're completely addicted to our multi-monitor rigs, we want true 3D flexibility across all of them. In Windows XP, you can drag your windows from one display to another, unless of course the window holds a Direct3D app, in which case Windows simply won't draw the 3D-accelerated content. This is a major pain for gamers and professionals alike because it relegates any 3D applications to the primary display. To get real productivity—or serious gaming—out of a multi-display system, you need true 3D acceleration on all your displays. OpenGL has supported this feature for years, but Direct3D apps, which make up the vast majority of games, don't. With more and more content-creation apps moving to Direct3D, it's vital that this work.

Who does it right?

Once again, Apple has the lead here, and Linux isn't far behind. When Apple started from scratch with OS X, there was no reason 3D acceleration wouldn't work on more than one display. It's a little tricky configuring 3D acceleration on multiple displays for Linux, but it is possible. The bottom line is: It works. Whether you're fragging beasts or designing experimental aircraft for a secret government installation

Simplicity is the key to success in Mac OS X's Exposé feature. One tap of the F9 key brings all active windows into view, and a mouse-hover labels them for you. To return to normal, just click a window or hit F9 again.

In OS X, 3D-accelerated applications can stretch across multiple displays. Here you can see *World of Warcraft* spanning two displays on a dual-display rig.

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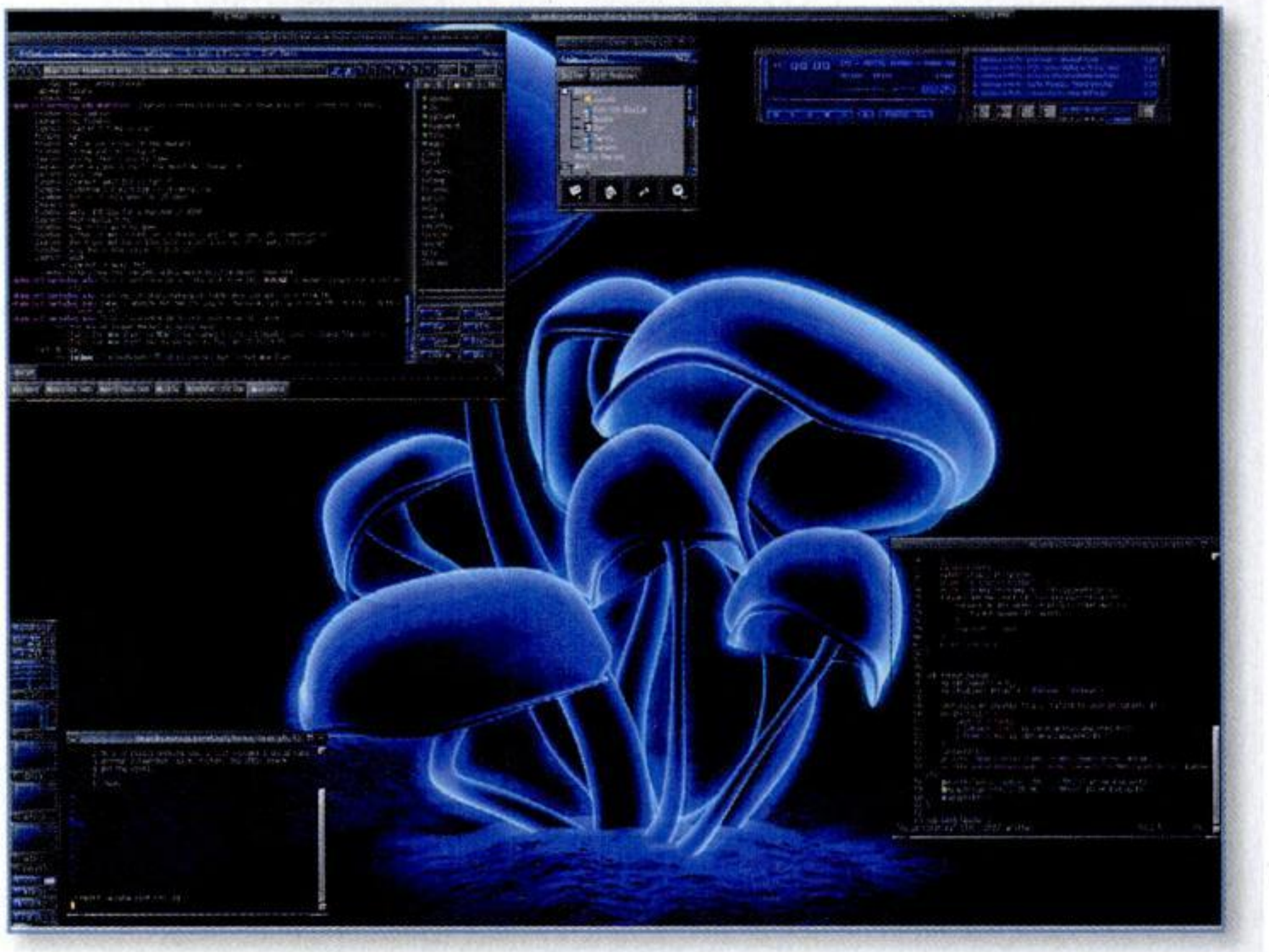
5 IDEAS MICROSOFT SHOULD STEAL

in the Nevada desert that nobody's supposed to know about, right now you'd do better to buy a Mac or go Linux if you want to use multiple displays. Apple's lead, however, extends only to running 3D windows on secondary displays. When it comes to stretching a 3D environment across three screens at once, no off-the-shelf OS performs the way we'd like it to.

We have no doubt that Microsoft will address this issue in Longhorn, and we can hardly wait to see the results. Aero Glass—the high-end Longhorn 3D interface—is supposed to draw a sharp-looking, pixel-shadered desktop on every display. We've got a billion or so gamer friends just chomping at the bit to stretch their *Half-Life 2* environments across three 21-inch displays, so this is one feature Longhorn better get right.

An aspect of 3D spanning that nobody has yet done right, however, is settings standardization. Microsoft has an opportunity to lead the way here, given its ridiculously large install base of 3D games. Longhorn should include a simple utility that gamers can use to set up their games to play across two screens, three screens, or more with a single click. What's more, we need the operating system to reconcile differences in refresh rates and resolutions between the various displays on a given system. After all, many multi-display rigs are cobbled together with whatever monitors the user happens to have lying around.



In Linux, you can customize your desktop interface with mods such as *Fluxbox* (www.fluxbox.org)—which tweaks every aspect of the user experience—without needing the administrator's blessing. And doing so won't screw up the other accounts on the system.

Easy-to-Use, Standardized Scripting

The whole point of having a computer is to automate repetitive tasks. Whether you're importing contact lists from one application to another or converting lots of audio files to a new format, repeatedly clicking-and-dragging-and-clicking is a waste of time, and it's frustrating. Windows has never offered an end-user-friendly scripting solution to automate simple tasks, so users have always relied on third-party utilities to do these things for them. We need an easy, standardized way to generate automation scripts for all this stuff, and we need it yesterday.

Who does it right?

We hate to keep pointing to Apple—oh, how it pains us—but the fact is that every version of Mac OS has shipped with a simple scripting utility since the release of System 7 in 1991. The release of OS X Tiger in April of this year took AppleScript to a new level with a graphical scripting tool called Automator. With Automator, you just click the app you want to automate, select your actions from a list, and drop them into your script in whatever order you want.

Linux weenies aren't left out, either. The Linux Bash shell comes complete with ubiquitous script support. However, it's not easy to use. The syntax used in a Linux script can be daunting to even long-time users, and downright terrifying to newbs.

Microsoft has consistently dropped the ball on scripting, but promises to compensate for lost time with Longhorn. This is no surprise, because many Longhorn apps are written using the new XAML markup anyway, which is essentially a super-charged scripting language. If Microsoft can't work up an easy scripting utility from that, we're all in serious trouble.

Comprehensive Permissions Enforcement

Limited user accounts in Windows XP are a joke. Limited accounts can't play many games, can't install apps, and can't change basic settings—like the time. However, by running as a limited user, you avoid many of the problems that plague Windows today. The limited account protects you from self-installing spyware and viruses gone wild. Of course, it's a hassle to switch back and forth between your limited user account and administrator account every time you want to add a new network connection or install a new game. This is boneheaded at best.

Problem *numero uno* is making games work properly for limited users. Microsoft's Games for Windows program only certifies games that are compatible with limited user accounts in Windows XP. Unfortunately, the vast majority of games on the market still don't comply, and there's little chance this situation will

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5 IDEAS MICROSOFT SHOULD STEAL

improve dramatically before Longhorn hits store shelves.

But the biggest problem with Windows permissions is that user accounts have too little control over customization of their environments. Sure, they can change their desktop wallpaper to their hearts' content. But if they want to use alternate browsers or set a default word processor other than the one used by the administrator, they're plum out of luck. Of all the gripes we have with XP, this might be the biggest, and Microsoft needs to fix it immediately.

Who does it right?

Every Unix or Linux distribution on earth does a better job of handling user accounts and permissions than Windows XP does. This has everything to do with the fact that Unix was created to manage multiple user accounts in a networked world, while Microsoft sort of tacked on user management as an afterthought once it realized that multiple people will use the same machine, even in a home situation.

In Unix, each user has plenty of control over his or her environment. If you want to use a different shell than the one your administrator selected, you can change it with a quick text command. You can even swap out your whole desktop environment or install software without affecting other users in any way, so long as the app you're installing doesn't require root privileges. The same goes for Mac OS X, which is based on NetBSD Unix. MPC

In the interest of simplicity, OS X takes a more paternal stance on user permissions than the average Linux distribution does. But its implementation is still far better than that of Windows XP.

Extra Credit

Here are three OS enhancements that, while not crucial, could make the Longhorn experience much more satisfying if integrated at the OS level

Konfabulator

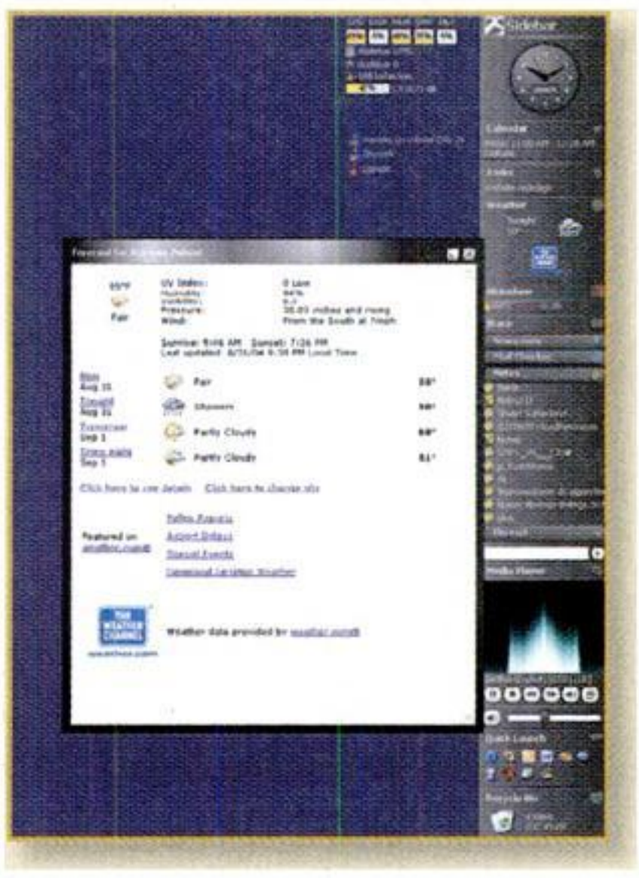
Compatible with a boatload of cool little widgets, *Konfabulator* is the ultimate desktop utility. Its low-profile interface supports everything from weather trackers and stock tickers to dictionaries and Wi-Fi finders. Mac OS X Tiger includes a *Konfabulator* clone called Dashboard. We'd like to see something similar ship with Longhorn.

PDF Maker

PDF has emerged as the de facto format for universal document sharing, yet the only way to view them in Windows is to install the morbidly obese *Acrobat Reader* or some third-party PDF utility. OS X supports PDF natively, and even produces its own PDF files from the print utility. We see no good reason why Microsoft can't do the same.

RSS Reader

You shouldn't need an open browser window to get news and feeds from the web. Microsoft needs to take a cue from Apple and build RSS support into Longhorn. That way, we can get real-time news feeds straight to our desktops instead of staring at pictures of bunnies and kitty cats every time we close our active window. Utilities such as *Desktop Sidebar* (**www.desktopsidebar.com**) can add this feature to Windows XP, but we'd like to see it integrated at the OS level. Sadly, while it was originally slated to appear in Longhorn, Microsoft is planning to pull this feature from the new OS.



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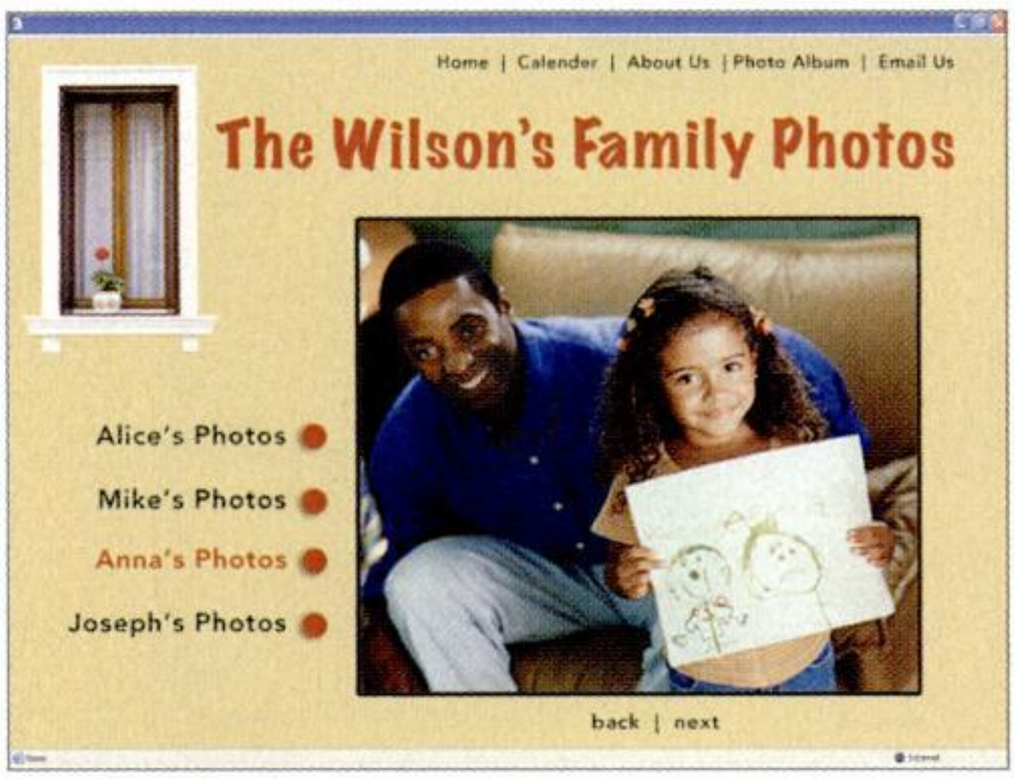

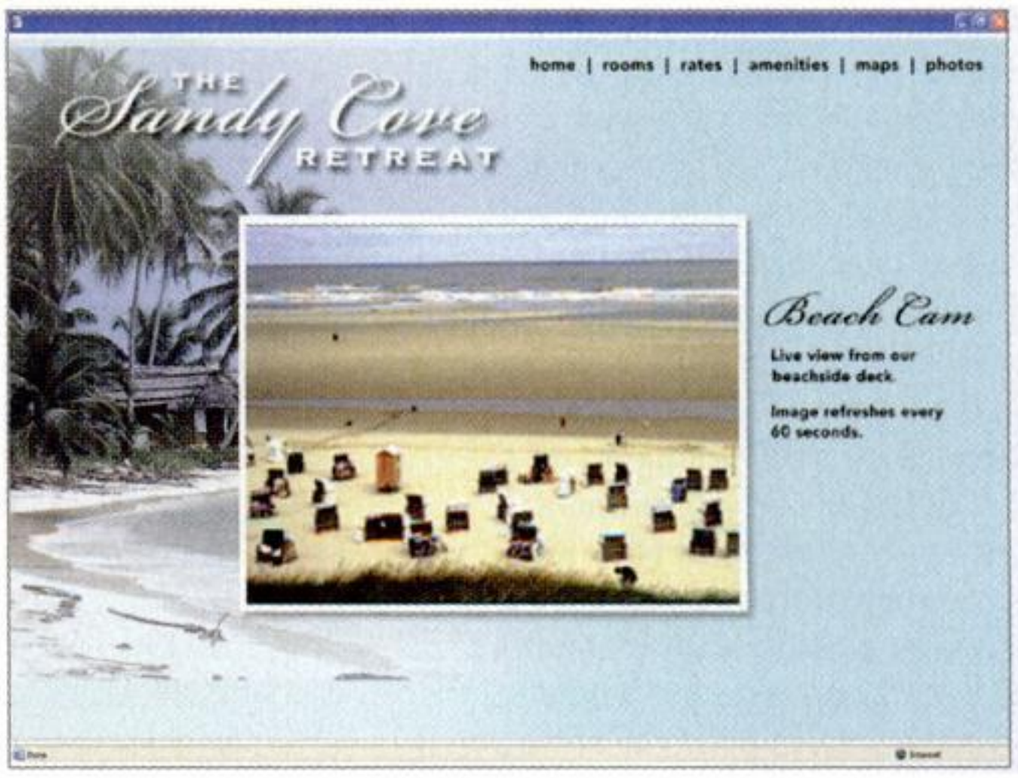

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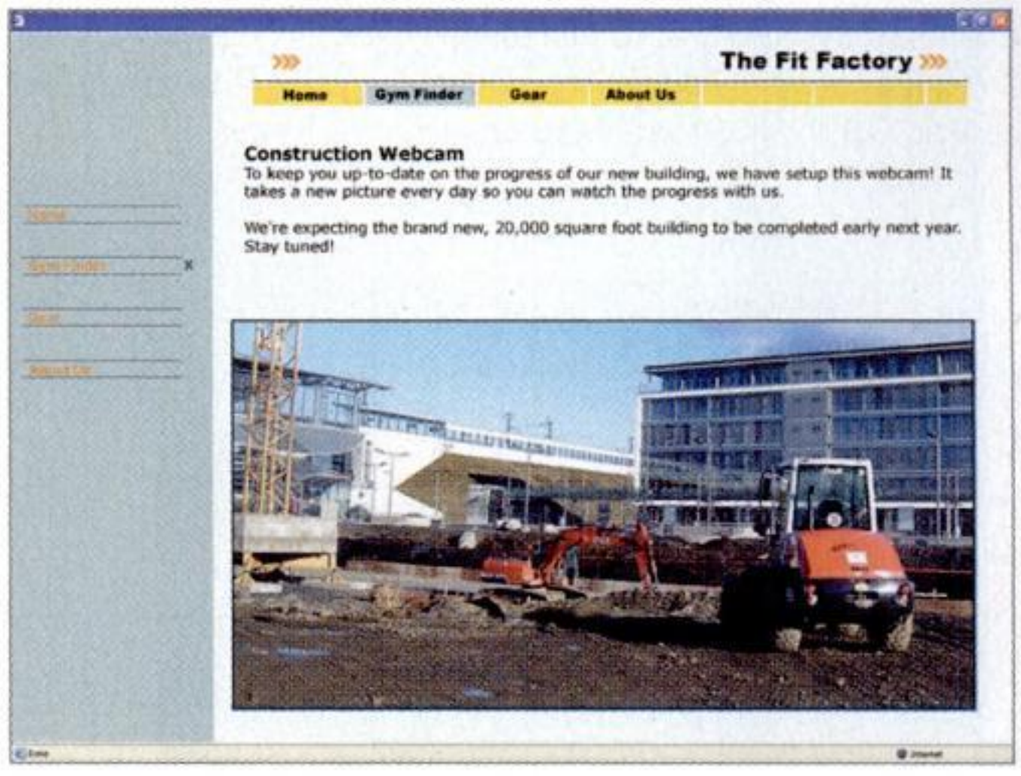
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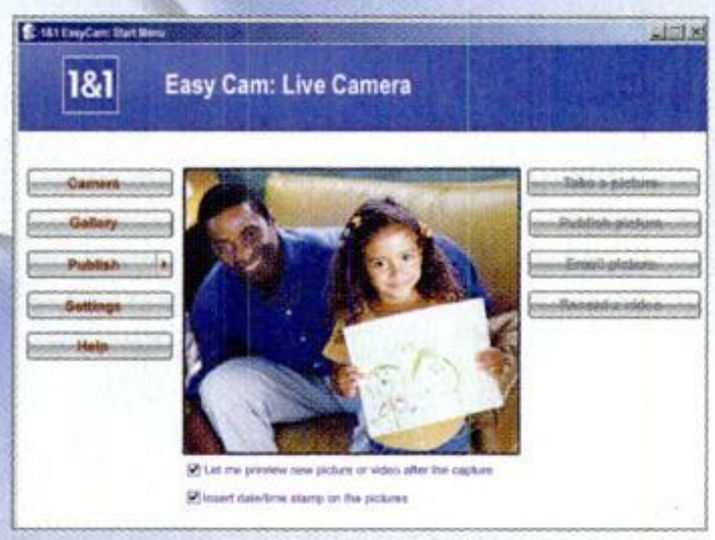

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WebsiteCreator	12 pages	12 pages
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FrontPage extensions	✓	✓
CGI library	✓	✓
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Included Domains	1	1
Subdomains	10	10
Run multiple independent sites	✓	✓
Full DNS management	✓	✓
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E-mail accounts w/ 1 GB space each	200	200
Aliases, auto-responders, forwarding	✓	✓
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Spam filtering for all accounts	✓	✓
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SECURITY FEATURES		
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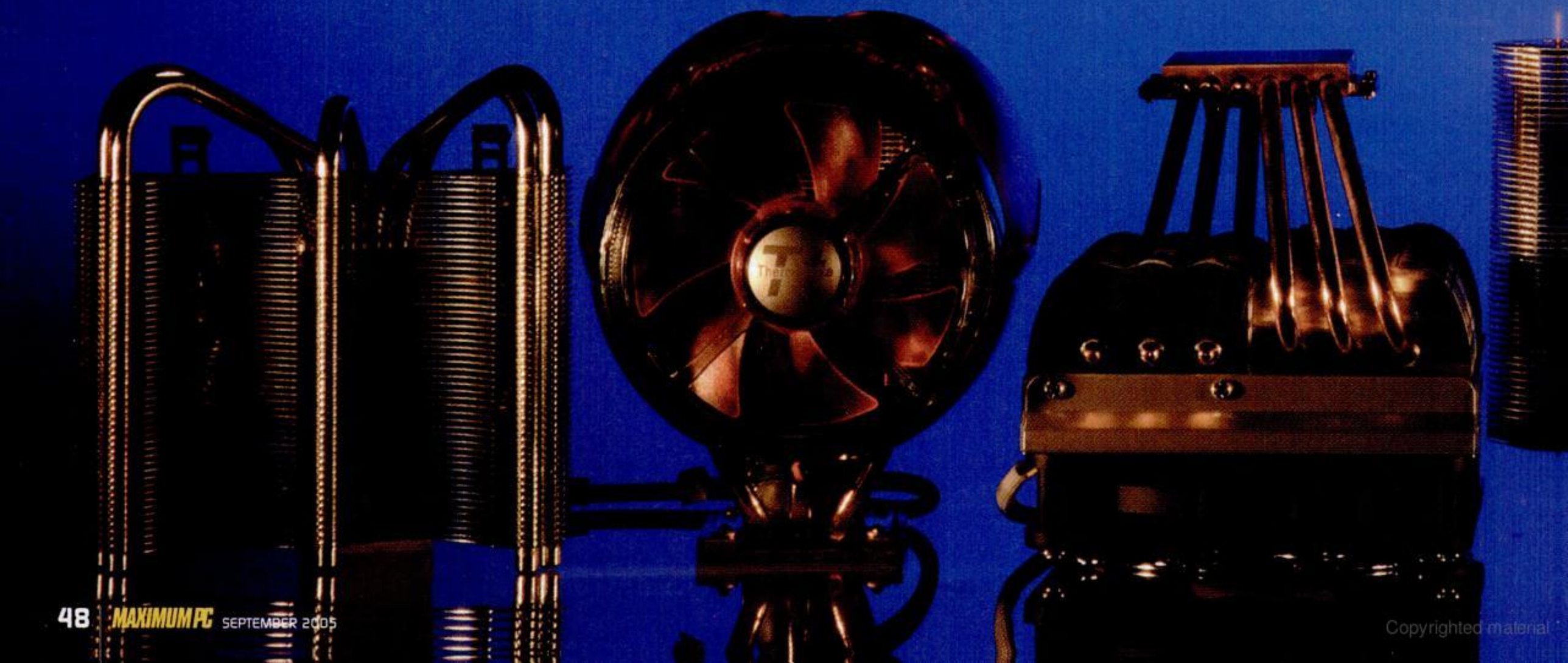
THE HEAT IS ON

Maximum PC schools you on the basics of air cooling, then cranks up the heat on 10 of the most audacious CPU heatsink/fan combos in town

BY JOSH NOREM AND MARK BEHNKEN

Your CPU is running so hot you've put it on suicide watch, and the fan cooling it is louder than the sucking noise made by Adam Sandler's latest movie—clearly, it's time for an intervention. Sure, there's always water cooling—which we still recommend for overclockers—but that requires delicate surgery with tubing, reservoirs, and pumps, and of course there's also all that water circulating inside your PC. And so air-cooling remains the easiest and most convenient way to manage your CPU's temperature.

We rounded up 10 of the brawniest heatsink/fan combos we could find and put them through their paces in the Lab on both AMD and Intel platforms, testing performance, ease of installation, and noise level. Thanks to universal mounting mechanisms, all of these heatsinks work on every AMD and Intel CPU from the last three years. So unless you're still



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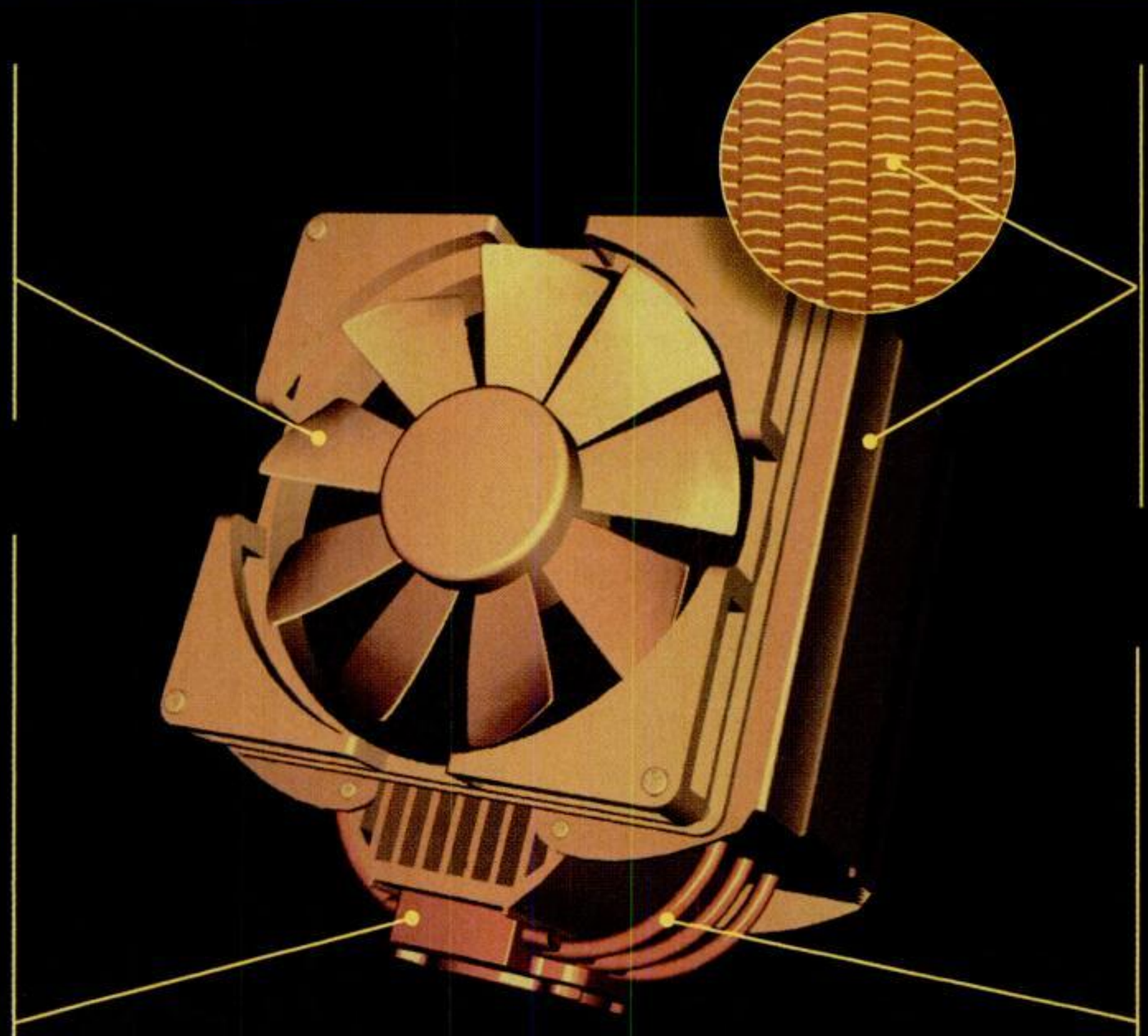
GETTING TO KNOW YOUR CPU COOLER

FAN
A fan increases a heatsink's effectiveness by constantly replacing the warm air rising from its radiator fins with fresh, cool air. Ideally, the warm air is then evacuated out of the PC's case. Fan performance is measured by the volume of air it's capable of moving, measured in cubic feet per minute (CFM). An 80mm fan typically moves 25 to 35CFM; a 120mm fan can move up to 75CFM or more.

BASE PLATE
This is ground zero—where the heatsink makes direct contact with the heat spreader resting on top of the CPU core. Copper is the most effective base-plate material because of its high conductivity. Whatever material it's made from, the base plate needs to be as smooth as possible in order to transfer heat from the CPU's heat spreader, so most are polished to a mirror-like finish. Still, if you examine even a highly polished base plate under a microscope, you'll discover pits and surface flaws that reduce the heatsink's efficiency. Fill in these gaps with thermal paste and you'll create a better bond between the heatsink and the base plate.



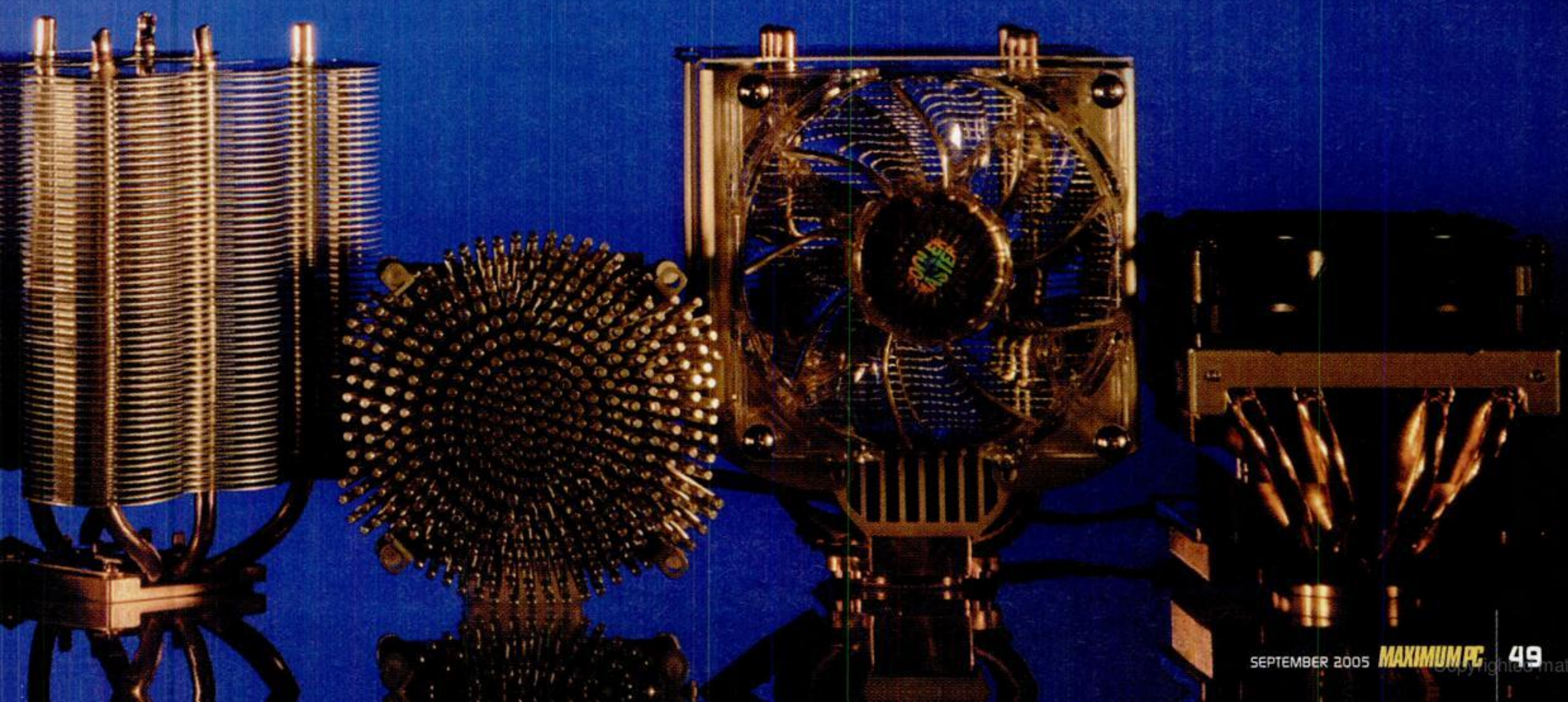
FINS
When cool air blows over the surface of a warm heatsink, the heat dissipates into the air. The more surface area a heatsink possesses, the better it will be at dissipating heat. Much like the radiator in your car, a CPU heatsink uses a dense array of fins to maximize its surface area while minimizing its footprint. Aluminum is the most common material used for heatsink fabrication, because it's cheap and can be pummeled into wafer-thin sheets to provide lots of surface area for radiating heat.

HEAT PIPE
A heat pipe is a sealed conduit with liquid inside, and its job is to wick heat away from the CPU core and up into the fins of the heatsink. As the heat transfers from the CPU core to the liquid, the liquid evaporates and travels up the heat pipe. As soon as the vapor has moved far enough away from the heat source, it condenses back into liquid and drains down to the base of the heat pipe. This process of evaporation and condensation is called a "phase change," and the process happens constantly as long as the PC is running.

tinkering with a real antique, you're sure to find a heatsink here that could put a big chill in your case right now.

HOW WE TEST

We installed each heatsink on two platforms: An AMD system using an Asus A8N SLI Deluxe with an FX-55 CPU, and an Intel setup using an Abit AA8 with a Prescott 3.6GHz CPU. Temperature readings (reported in Celsius) were taken using the thermal diodes on the boards, as obtained from *Asus AI* utility and Abit's *uGuru* utility, respectively. To measure noise levels, we took each motherboard into the quietest room in our office, lowered it into a foam chamber (with nothing but the CPU fan attached), and took readings with a Radio Shack decibel meter from a distance of 24 inches. Finally, we measured temps under full load. To achieve 100 percent CPU load, we ran *CPU Burn-in* for one hour.



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GIGABYTE G-POWER BL

Gigabyte's G-Power cooler sports a unique "overhang" design that strikes an impressive balance of overall performance and sound output. Its copper base plate (which is nickel-coated to prevent oxidation) sends heat to four heat pipes, which carry the warm stuff up into an array of aluminum fins. A speed-adjustable 110mm fan with blue LEDs blows air down through the fins and out in all directions over the CPU core. This clever design helps cool memory, capacitors, and other nearby components, as well as the CPU.

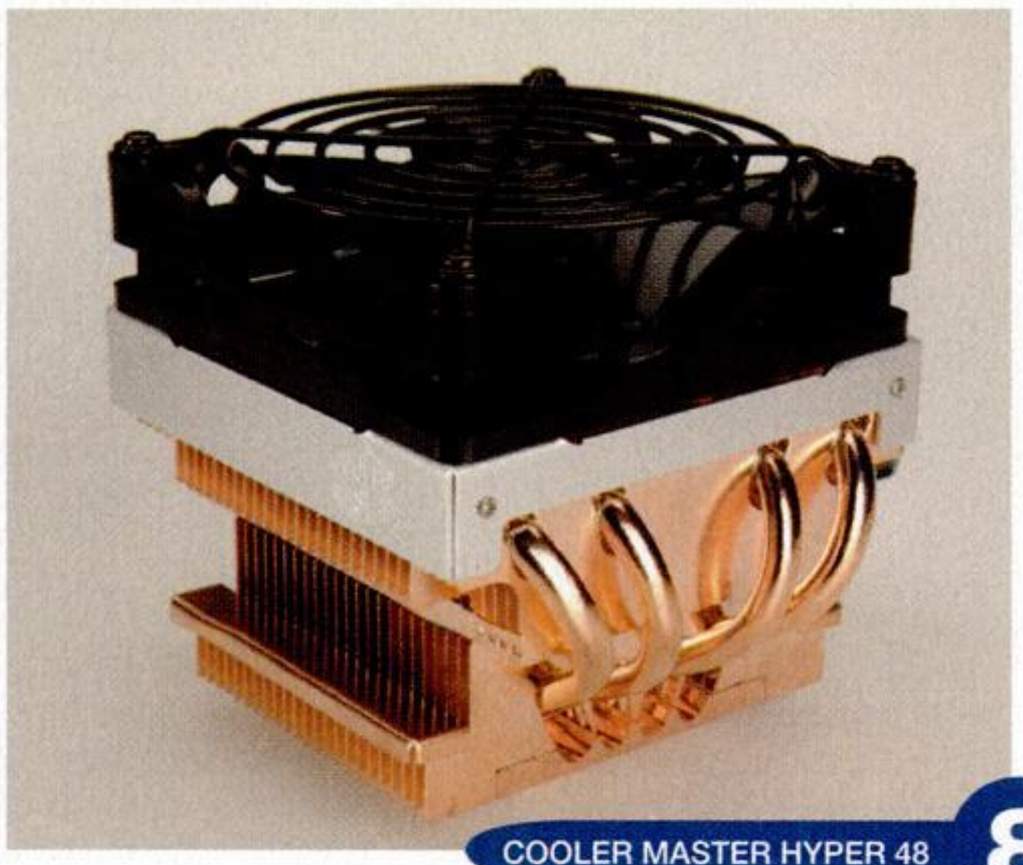
Installation was straightforward and extremely easy. The G-Power includes a tiny step-down cable that attaches to the three-pin power lead. When connected, it lowers fan speed from 2,000rpm to 1,700rpm. The G-Power was impressive across the board, but the CPUs we tested it with ran just a smidge hotter than the coolest coolers in the bunch.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
G-Power (fan high/low)	**33/34**	**46/48**	**38/39**	**52/54**	**66/63**
Stock cooler	36	52	42	57	67

GIGABYTE G-POWER BL **9**

$40, www.giga-byte.com

COOLER MASTER HYPER 48



This little guy stands out from the competition by being a bit smaller than most and fabricated entirely of copper. It has four copper heat pipes, copper fins, and a 92mm fan. The fan features pulse-width modulation (PWM), which varies speed according to your CPU's temperature (although this feature is supported only on LGA775 boards as of press time). When the CPU core reaches a designated temperature (set in the BIOS), the fan spins up to 3,200rpm; but we never reached that level in our testing, so the fan ran at a constant—and quiet—1,440rpm.

This product was one of the easiest to install of the entire roundup (in fact, all the Cooler Master units were a cinch). In our tests, the Hyper 48 performed better than the stock coolers across the board, but it didn't reduce temperatures as efficiently as the other coolers in this roundup.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Hyper 48	**33**	**48**	**37**	**54**	**63**
Stock cooler	36	52	42	57	67

COOLER MASTER HYPER 48 **8**

$40, www.coolermaster.com

THERMALTAKE BIG TYPHOON

This stunning heatsink sports the typical copper base, six heat pipes, and a gaggle of aluminum fins that hang over the processor zone. A 120mm fan—the biggest in this roundup—sits atop this dense apparatus, blowing down air to carry heat radiated from the fins and cooling the area around the CPU socket. The fan provides arctic-quality cooling despite the fact that it spins at a near-silent 1,300rpm.

Installation was easier than average—much easier than with other Thermaltake products we've reviewed recently. The Typhoon quietly administered exceptional cooling to our test CPUs: The numbers it posted were among the best in the roundup. The only knock against this cooler is that when it's installed in a case, the case door is so close to the fan that it starves it of air.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Big Typhoon	**31**	**44**	**36**	**51**	**63**
Stock cooler	36	52	42	57	67

THERMALTAKE BIG TYPHOON **8**

$50, www.thermaltake.com

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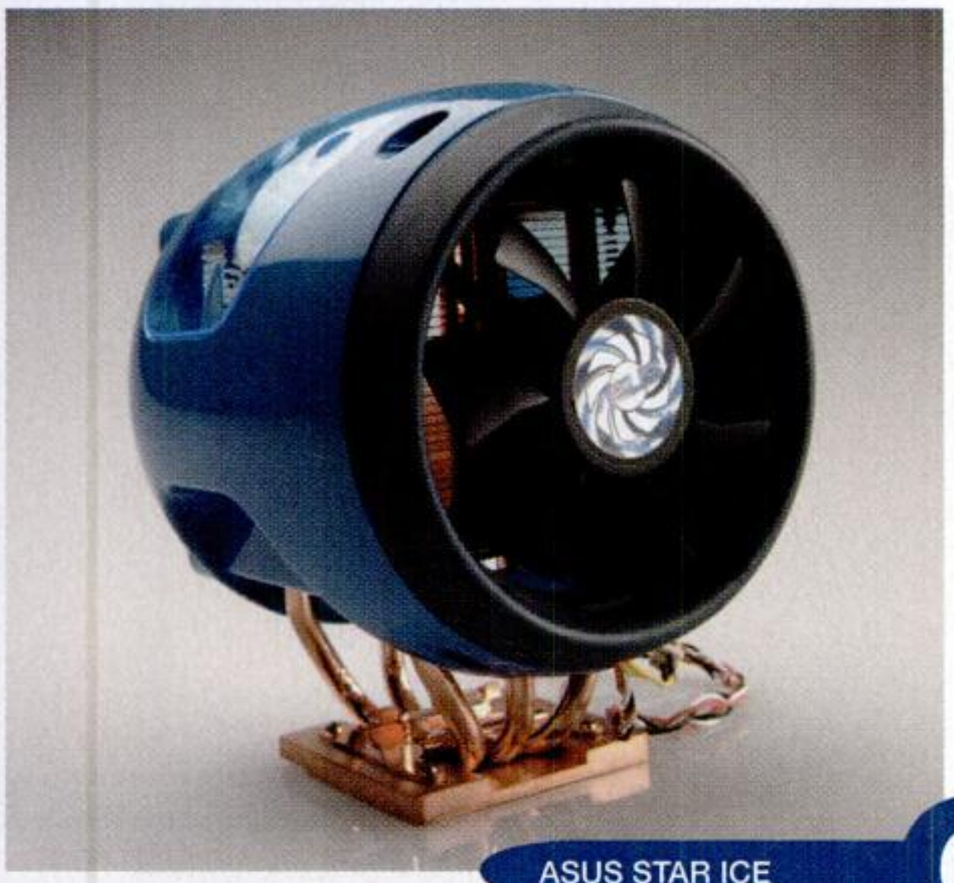


ASUS STAR ICE **6**

$47, www.asus.com

ASUS STAR ICE

The Star Ice is a massive copper heatsink with a plastic shroud that directs airflow over its fins. The problem is that the small 80mm fan it uses has to spin like the dickens to dispense the accumulated heat. Consequently, the Star Ice was the loudest heatsink in the roundup by a large margin; it emits an annoying audible hum at even moderate speeds.

Asus provides all the tools needed for installation, a process that's rendered tricky by the heatsink's massive girth. The Star Ice is the only heatsink in this roundup to provide the convenience of an externally accessible fan-bus.

As the numbers show, the Star Ice runs much hotter than the stock cooler with its fan set at its slowest, quietest setting; but it's so insanely loud when set to high that its otherwise-good temperature-reduction numbers are rendered irrelevant.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Star Ice (fan high/low)	**35**/40	**48**/59	**38**/42	**52**/62	72/**62**
Stock cooler	36	52	42	57	67

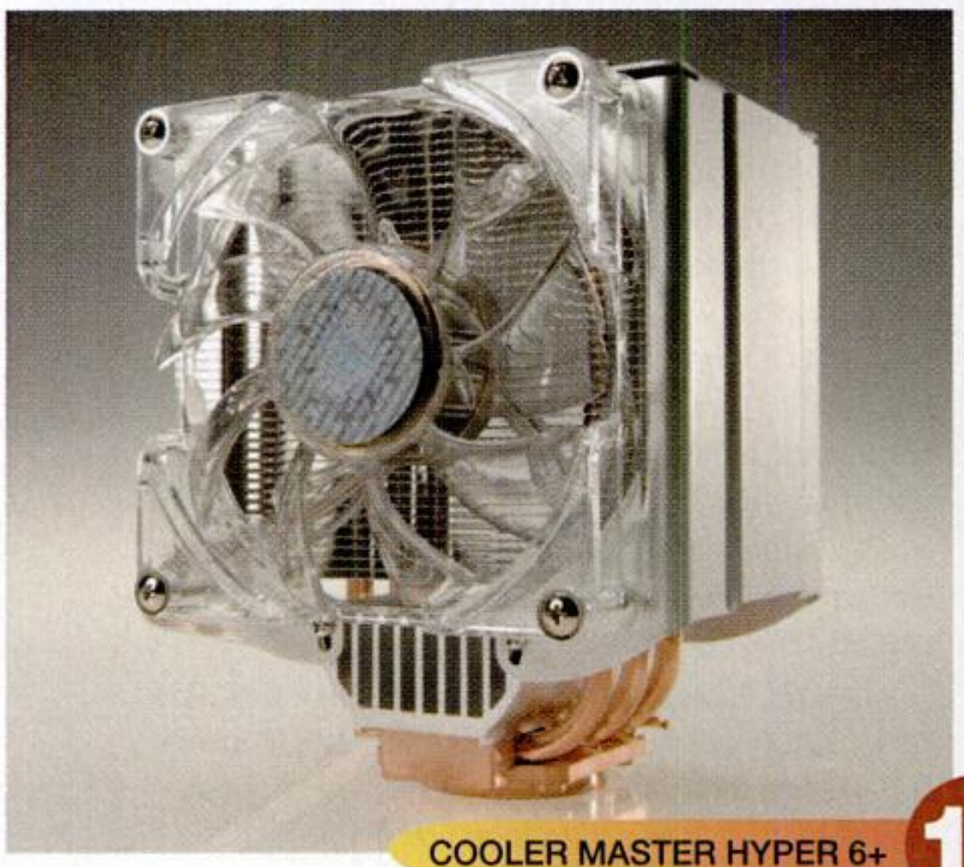
COOLER MASTER HYPER 6+

The towering Hyper 6+ weighs in at almost two pounds. It sports a hulking copper base, six copper heat pipes, a field of saw-tooth aluminum fins, and a 100mm fan. You can even secure a second 100mm fan, but we think it would be overkill.

As with all the Cooler Master heatsinks we reviewed, installation was a breeze. And once the Hyper 6+ was up and running, we were astonished by the low temperatures it delivered, considering its quietude: The fan was nearly silent while spinning at 1,800rpm. The Hyper 6+ supports PWM, too, but because the processor never got very hot, the fan modulation never kicked in.

Despite its bulk, we experienced no clearance issues on either test platform. From installation, to performance, to sound output, the Hyper 6+ kicks ass in every way possible.

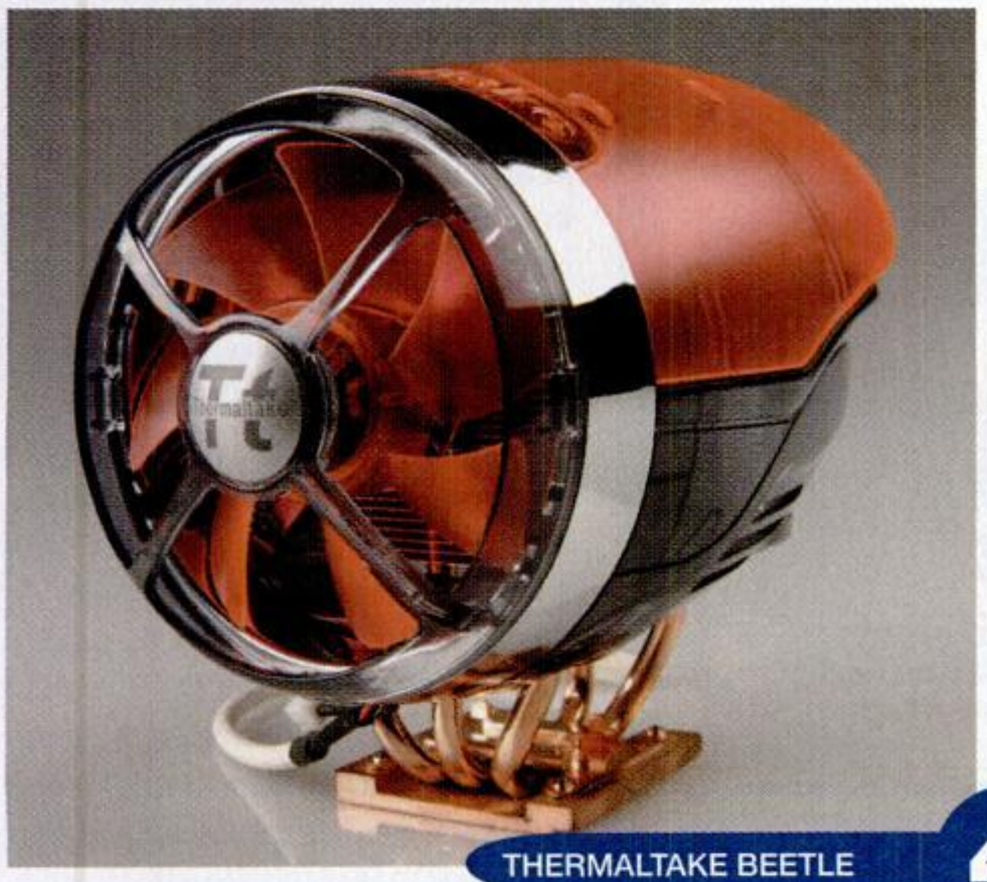
	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Hyper 6+	**33**	**44**	**38**	**52**	**62**
Stock cooler	36	52	42	57	67



COOLER MASTER HYPER 6+ **10**

$55, www.coolermaster.com

MAXIMUMPC KICKASS



THERMALTAKE BEETLE **4**

$55, www.thermaltake.com

THERMALTAKE BEETLE

The Beetle is a gargantuan copper heatsink with a shroud that channels air from a small, high-speed fan through its fins. During testing, the Beetle reminded us of another word that starts with the letter "B." We could not get this heatsink mounted to our LGA775 platform thanks to an idiotic design that demands massive pressure applied to a screw the size of a Tic Tac. It went into our AMD platform with relative ease, but its performance was nothing to write home about. The Beetle kicked ass when its fan was set to high, but it was far too loud. Set to low, the unit was quiet, but its temps were considerably hotter than the stock unit.

We think the miniature-football design of both the Beetle and the Star Ice is a bold step—in the wrong direction.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Beetle (fan high/low)	**32**/37	**44**/59	NA	NA	69/**60**
Stock cooler	36	52	42	57	67

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COOLER MASTER VORTEX TX

We've come to expect superior performance from Cooler Master, but the Vortex TX let us down. We thought that with its solid-copper heatsink, 184 fins, and 92mm fan, it had the chops to get the job done. We were wrong. In fact, the Vortex TX proved to be more of a CPU *warmer* than a cooler.

Although extremely quiet during testing, its performance was downright dreadful. AMD and Intel CPU temps at idle and under load were either the same—or much hotter—with the Vortex TX than they were with stock cooling solutions. Like the other Cooler Master products, it uses PWM to vary fan speed according to CPU temps, but we never reached that plateau so the fan spun at 2200rpm at all times.

Sure, the unit is easy to install and it operates quietly, but do you think we'd recommend a cooler that performs worse than the stock unit? *As if!*

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Vortex TX	36	59	42	67	**63**
Stock cooler	36	**52**	42	**57**	67

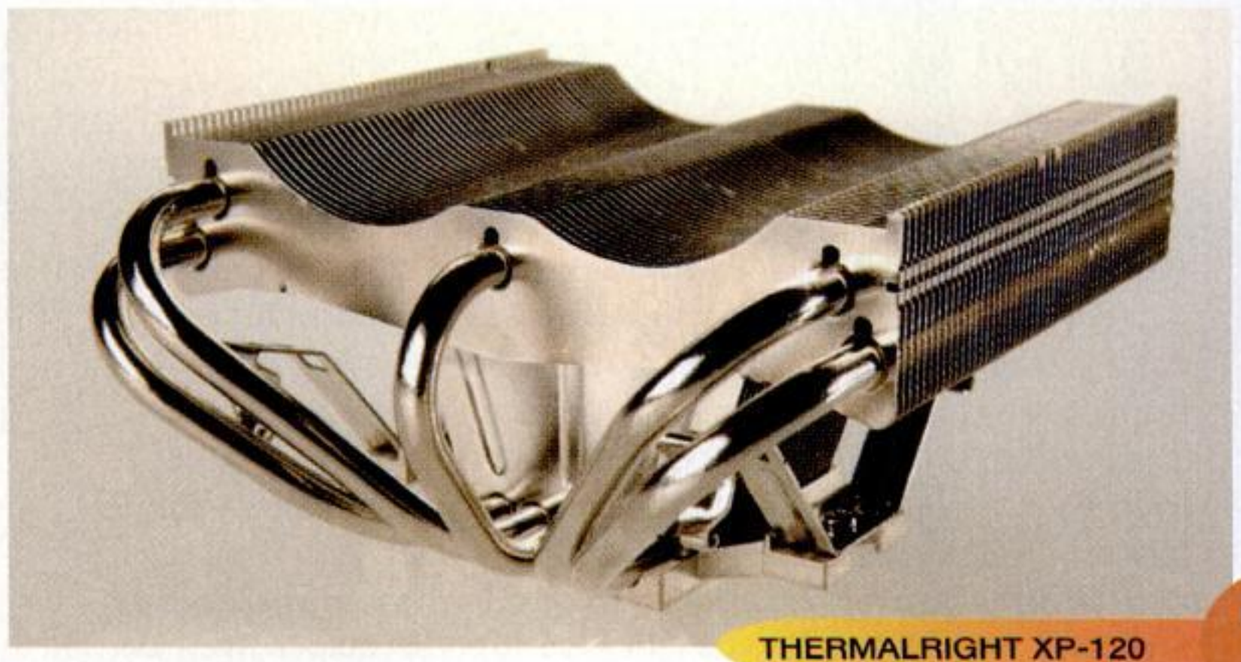
COOLER MASTER VORTEX TX **5**

$40, www.coolermaster.com

THERMALRIGHT XP-120

The XP-120 covers a huge surface area with five heat pipes and densely packed aluminum fins. It's great for cooling, but it's a mini-bitch to install. The heatsink overhangs the entire region surrounding the CPU, so we had to reach underneath it with a flathead screwdriver to secure it to the included retention module. We also had to temporarily remove the fan on our north bridge chip, and then wedge it back into its slot after we'd set up the XP-120. The next step was to attach little arms (included) to secure a fan (not included—we used an adjustable-speed 120mm Thermaltake) to the heatsink.

The XP-120 is impressive, but its giant wingspan was just too much for our Abit AA8 mobo. If you're considering this solution for your PC, we suggest you whip out a measuring tape first so you can avoid the clearance problems we encountered.



THERMALRIGHT XP-120 **7**

$55 (plus $5 for LGA775 module), www.thermalright.com

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
XP-120 (fan high/low)	**31/34**	**41/45**	**36/38**	**49/54**	**65/61**
Stock cooler	36	52	42	57	67

THERMALRIGHT XP-90

Baby brother to Themralright's XP-120, the XP-90 uses the same nickel-plated copper base and aluminum fins, but it's outfitted with one less heat pipe. It's designed to be used with a 92mm fan (not included), so we used one that spun at 2,940rpm. For the record, Thermalright recommends the Panaflo, which pushes 48CFM at 30dBA.

The XP-90's smaller size makes for an easy installation: It's a simple matter of securing two easy-to-attach clips. The heatsink posted scores significantly lower than those we got from the stock coolers. Considering its overall competence and low price (the lowest of this roundup, in fact), we consider this to be a better buy than the XP-120.

THERMALRIGHT XP-90 **9**

$37, www.thermalright.com

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
XP-90	**33**	**47**	**38**	**55**	67
Stock cooler	36	52	42	57	67

ALUMINUM VS. COPPER

Aluminum isn't the best at conducting heat, but it's very inexpensive; and because it's a lightweight material, it can be easily molded into intricate shapes. Copper, on the other hand, is relatively expensive and fairly heavy, though it's an excellent heat conductor.

To provide effective heat radiation at a reasonable cost, most high-performance CPU heatsinks are designed with both aluminum and copper components. Heat pipes fabricated from copper wick heat away from the CPU and into radiator fins made from aluminum. Because aluminum is so easy to mold, it can be folded into intricate arrays that provide a tremendous surface area over which heat can be dissipated.

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THERMALTAKE SILENT TOWER

This super-sized cooler features a copper base with six heat pipes attached to twin aluminum fin towers, which amounts to some serious CPU cooling. A fan isn't included, but one is absolutely necessary.

The Silent Tower was a relatively easy installation on our AMD mobo, but the fan just barely fit. Aside from that, it proved to be a stunningly cool solution. We managed to get the heatsink installed on our LGA775 system, but we couldn't attach the fan because it hung over the first two memory slots on our Abit board. The bottom line: This cooler offers terrific performance, but it's simply too big for most mobos.

	AMD idle (C)	AMD load (C)	Intel idle (C)	Intel load (C)	Sound output (dBA)
Silent Tower (fan high/low)	**29/30**	**37/41**	NA	NA	68/**60**
Stock cooler	36	52	42	57	67

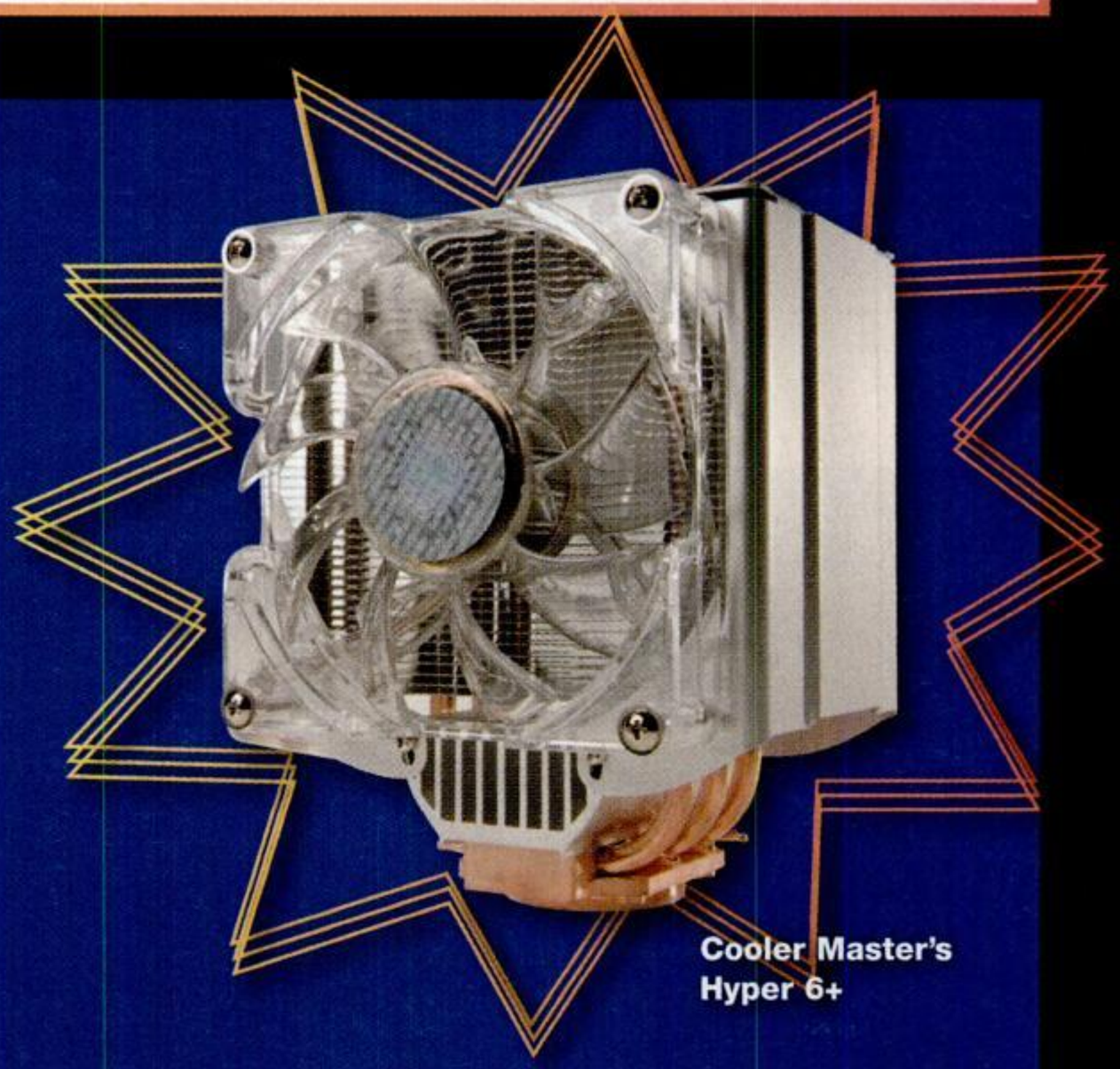
THERMALTAKE SILENT TOWER **7**

$50, www.thermaltake.com

AND THE WINNER IS...

Whew! This was a close contest. Several heatsinks left us thoroughly impressed, and we were surprised to have so many contestants fighting for top honors. When it came down to the final tally, we had to pick nits: We took into account the temps and sound output, considered installation difficulties, and sought counsel from our spirit animal. In the end it was clear that Cooler Master's Hyper 6+ is the top choice. We found this heatsink to be virtually without fault. Sure, it's huge and heavy, but we didn't encounter any clearance issues, installation was effortless, and the part delivered stunning performance. What's more, you can add a second 100mm fan for even more cooling power.

Thermalright's impressive XP-90 is the runner-up. Its compact size, great price, and excellent performance make it a contender for anyone who needs a cool CPU.



Cooler Master's Hyper 6+

AIR VS. WATER COOLING

When PC enthusiasts want to manage the heat generated by their CPUs and GPUs, the two most popular methods are air and water cooling. Each has distinct advantages. Air cooling, for its part, is considerably more affordable: The most expensive heatsink/fan combo in this roundup costs about $55—compare that with the $100-to-$250 price tags you'll find hanging on a run-of-the-mill, CPU-only water-cooling kit. Plus, CPU heatsinks are much easier to install; most of the time, you can just pop a unit onto the CPU socket and be done with it. There's no need to route tubing, you don't have to bleed lines, and there's no risk of spills or leakage. Lastly, air cooling is so popular that you'll have plenty of choices—it's a buyer's market.

Water cooling, on the other hand, is much more effective at reducing component temps. These high-priced kits are targeted at the enthusiast crowd—overclockers and extreme gamers—who tend to push their PC components to the limit. And these kits usually deliver on their promise, because when it comes to absorbing heat, water is not only more efficient than air, it also keeps temperatures more stable. The temperature of an air-cooled CPU, for example, might register an increase of 20 Celsius under load. The temperature of a water-cooled CPU, meanwhile, might fluctuate by only five or six Celsius under load.

Most users, however, will find it difficult to justify the cost and the potential snags associated with extravagant water-cooling solutions. As we discovered here, air-cooling kits can be highly effective and much less expensive. MPC

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Make Your Loud PC Whisper Quiet

Silent but deadly can be a good thing. Quiet your PC with this component-by-component guide

TIME 02:06 HOURS:MINUTES

We've already shown you how to build a really, really quiet PC (February 2005), and many of you did just that. Some folks, however, balked at the idea of buying a Pentium M motherboard, a new CPU, a new case, and other gear to obtain peace and quiet—you simply wanted to hush the machine you currently own. So this month, we've compiled an easy-to-use guide to reducing the noise levels of your rig's various components. We'll take a close look at each of your computer's subsystems and identify its most common sonic maladies, then offer suggestions for reducing—if not eliminating—the noise. We'll recommend bolt-on fixes and tweaks wherever possible, but in some cases, a hardware upgrade will be your best option.

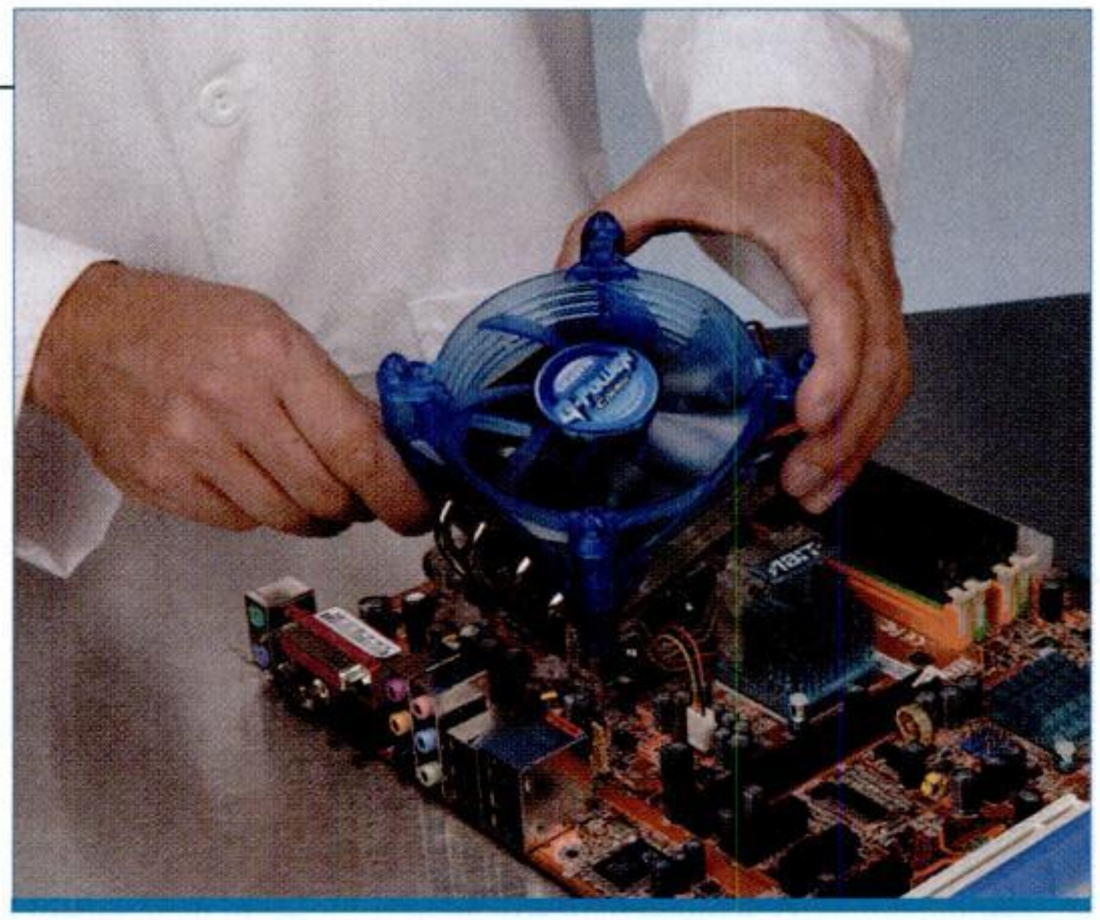
BY JOSH **NOREM**

1 CPU COOLING

The CPU is usually the hottest component in today's PCs; as such, it typically requires the most extravagant—and often the noisiest—cooling apparatus. Reducing the amount of noise emanating from your CPU's cooling system is a huge step toward muting your machine, so let's examine this hotspot first.

As luck would have it, we examine 10 of the best CPU coolers you can buy in this very issue (see page 48), and our two favorites—Cooler Master's Hyper 6+ and Gigabyte's G-Power—are exceptionally quiet while providing frigid temps. If you're using a stock cooler or an aftermarket unit that sounds like a Hoover, upgrading to one of these silent wonders will bring joy to your ears. Both cost less than $50, so they're an upgrade anyone can afford.

Water cooling is another way to reduce both CPU temps and overall noise levels. It takes care of the heat around your CPU, making a rear exhaust fan—a major source of noise—unnecessary in most cases. Unless you're a serious overclocker, however, water cooling probably isn't worth the time, money, and effort. You can usually achieve quietude with a massive heatsink/fan contraption.



Gigabyte's G-Power CPU cooler offers great performance without a noise penalty—its fan runs at a near-silent 21dBA.

2 CASE FANS

Much of the noise your PC produces comes from the fans whirling away inside it. Choosing the appropriate type and size of case fans, therefore, is a critical step in any PC-silencing venture. As a general rule, bigger is better; larger fans don't need to spin very fast to move lots of air. Small fans, or those running at higher rpms, generate a great deal of noise. A slow-spinning 120mm fan will always be quieter than a fast-spinning 80mm fan, and both can provide the same amount of cooling.

These days, our favorite case fans are Antec's TriCool series. Offered in both 80mm and 120mm sizes, they're equipped with switches that enable you to set their rotational speeds to 1,200, 1,600, or 2,000rpm. Vantec's Stealth series and Panasonic's Panaflo fans are also very popular with PC enthusiasts.

When shopping for a fan, you should always evaluate the volume of air it can move (expressed in cubic feet per minute, or CFM), and the amount of acoustical noise it produces (expressed in adjusted

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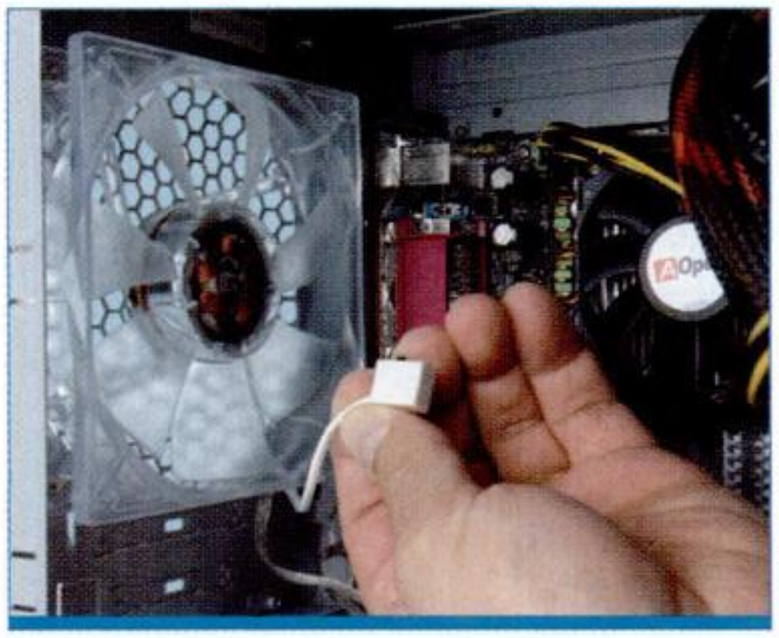
decibels, or dBA). In a perfect world, you could buy a fan with an ultra-high CFM rating and zero dBA output; but because that's impossible, seek an acceptable middle ground: a fan that can generate 40CFM of airflow while producing 30dBA of noise will provide adequate cooling and remain nearly silent.



Antec's TriCool fans let you select one of three fan speeds. Some case fans include thermal probes and will automatically adjust fan speed as temperatures rise.

3 THE CASE

There's not much you can do to make your case quieter, aside from adding acoustic absorption mats to its side panels to dampen the high-pitched whine from fans and drives. We've sampled a few of these mats, including Dynamat and Akasa's Paxmate, and they work well. But you should keep in mind that they also increase case temps a bit.

If you're in the mood for a new case anyway, we recommend purchasing one specifically designed for silent operation: Antec's Sonata II, for example, or its new P180, which is outfitted with TriCool case fans and noise-reducing triple-layer side panels.

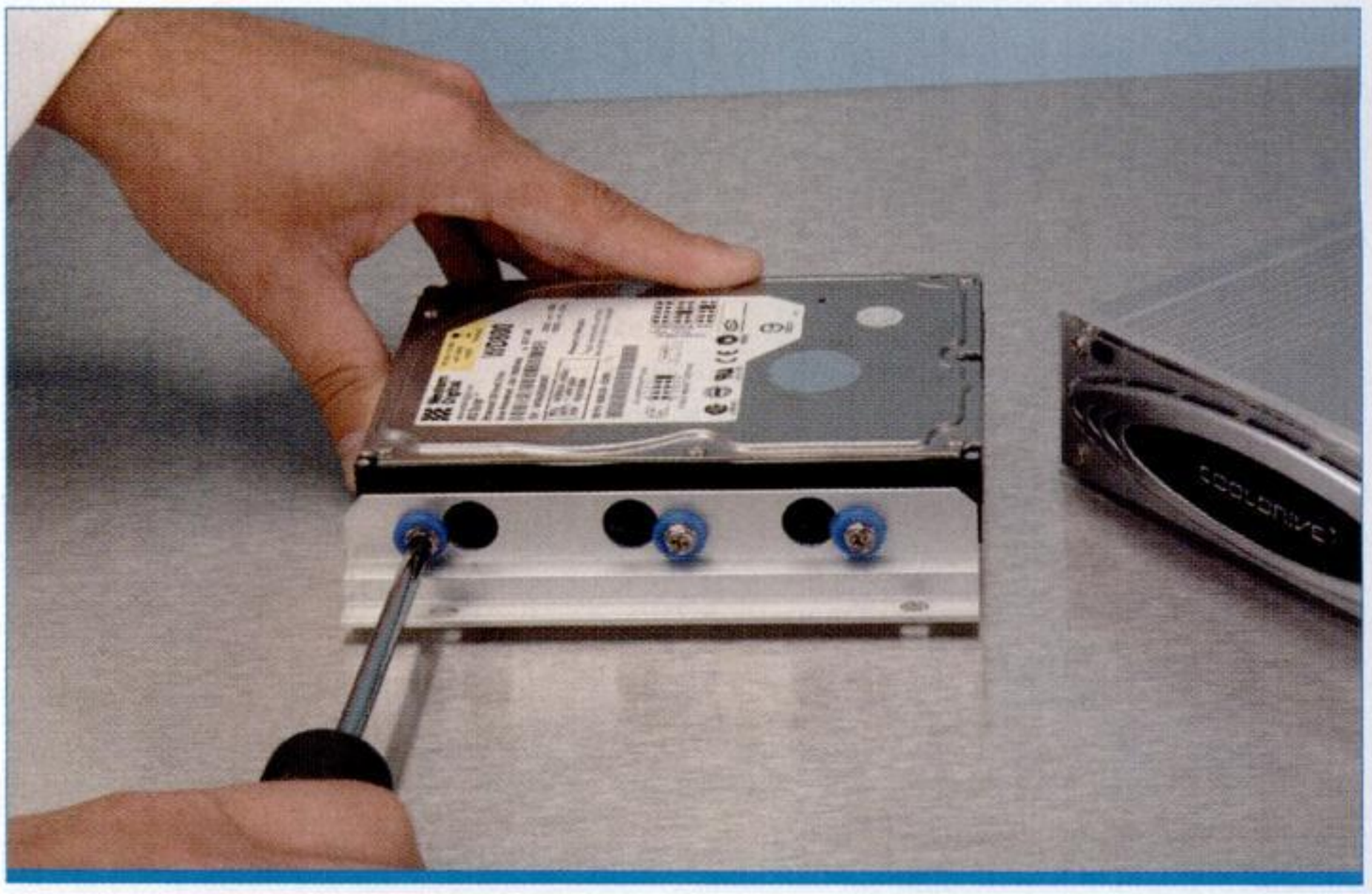
If you're not willing to buy a new, "silent" case, your best option is to install sound-dampening material inside your current enclosure.

4 MAGNETIC AND OPTICAL STORAGE

Aside from fans, your PC's hard drive is one of its noisiest components, but it's traditionally difficult to silence. One solution is to place the drive inside a padded and sealed anti-vibration drive enclosure. This will reduce its noise profile and restrict the amount of vibration the drive transfers to the case. Using this type of enclosure will also allow you to remove the intake fan from the lower-front of most PCs. Alternatively, you can buy some cheap rubber O-rings at a hardware store and use one on each of the four mounting screws.

If you're looking to replace your hard drive altogether, the introduction of fluid-bearing spindle motors has rendered modern hard drives exceedingly quiet. For even further quieting, Hitachi's new DeskStar drives come with a unique software utility that will slow down the drive's seek time for near-silent operation.

Silencing optical drives is nigh impossible; your best option is to upgrade to Samsung's model TS-H552U. Thanks to a fluid-bearing spindle motor, this is the quietest drive we've ever tested—it's whisper quiet even at full speed!



Hard drive enclosures like this Cooler Master model quell drive noise by reducing the amount of vibration transferred to the case during operation and using a teeny, silent fan to cool the drive.

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5 VIDEOCARDS

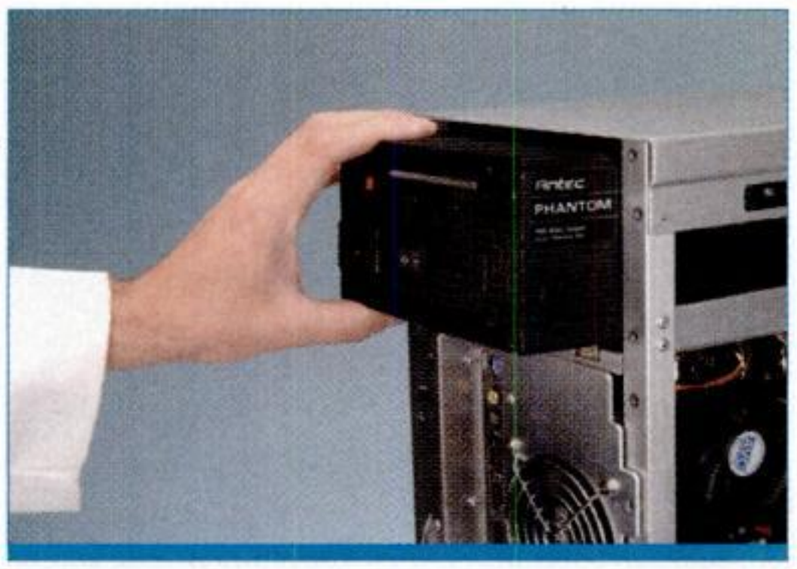
The cooling contraptions on many of today's videocards are insanely loud, and if you're going for full-monty performance, you should stick with the stock cooler. Low-noise videocard cooling solutions are generally designed to handle midrange cards—not dual GeForce 6800 Ultras in SLI. The only quiet solutions we've seen for high-end videocards are water-cooling setups with water blocks, pumps, and so forth. While it's acceptable to put a 5-inch-tall copper heatsink on top of a CPU, a videocard's clearance requirements limit your options—you don't want to block adjacent PCI Express slots. The primary objective of most VGA-cooler designs, therefore, is quiet operation as opposed to super-cool operation.

If you're running a midrange card and can't stand the noise, here are a few options: Zalman and Thermalright both manufacture VGA coolers that are essentially massive bolt-on heatsinks equipped with slow-spinning fans (we've tested Zalman's, and it worked just fine on our vanilla GeForce 6800 card). There are also several fanless VGA heatsinks on the market, including Thermaltake's Schooner. The Schooner uses heat pipes to move heat away from the GPU core and into an aluminum heatsink that wraps around both sides of the card.

6 POWER SUPPLY

If you want a zero-decibel PSU, the only solution is a fanless model. Antec's Phantom series, Thermaltake's PurePower, and Silverstone's Nightjar PSU all use large passive coolers instead of noisy fans. We discovered that fanless supplies don't work well with fanless water-cooling setups—with absolutely no air circulating around the CPU area, the capacitors, memory, and MOSFETs on the PSU get way too hot.

If you're not ready to buy a new power supply, installing rubber gaskets where the PSU mounts to the case will at least reduce the amount of vibration (and noise) that's transferred from the supply.



Fanless PSUs are fabricated using aluminum heatsinks. They can become extremely hot during operation, but they're absolutely silent.

7 FAN CONTROLLERS

Who says your case fans must spin at a constant velocity? Connect them to a fan bus and you can spin them up while gaming or tasking your PC with other high-load chores, then spin them down to reduce system noise when the PC is idle. You'll see many such devices on the market.

Thermaltake's HardCano is one of our all-time favorite fan buses. The latest model, the HardCano 13, comes with a set of thermal probes that you can mount in various areas in your PC. Connect your system fans to the device and they'll spin up and down as the probes report temperature increases and decreases. You can even set thermal alarms for each probe. Now *that* is cool (pun intended). MPC

Thermaltake's Hardcano 13 controls up to four case fans automatically, spinning them softly at idle and furiously during gaming.

Ask the Doctor

Diagnosing and curing your PC problems

QUOTING THE RAM KORAN

I just purchased 512MB of PC800 RDRAM to upgrade my PC, which brings its total memory to 768MB. I have a 40GB hard drive. According to "The RAM Koran" in your "Ultimate Upgrade Bible" [April 2005], I should have at least 1GB, and that 2GB is becoming the norm. Should I buy more RAM to bring my computer up to speed? And what's the difference between DDRAM and RDRAM? Or should I stop spending money on upgrades and save it to buy a new system?

—R. Cadet

You should stop spending money on RDRAM. Save your funds until you can afford to replace the motherboard, CPU, and RAM. To answer your question about RDRAM, the acronym stands for Rambus DRAM. Intel and Rambus once expected RDRAM to replace PC100 RAM, because it was faster and easier to scale to higher speeds. Rambus, however, turned greedy and developed a nasty reputation for suing other memory makers. This seriously hurt RDRAM's adoption rate. After an industry battle worthy of *The Lord of the Rings*, DDR DRAM (double data-rate DRAM) supplanted RDRAM as the memory technology of choice. And that's too bad, because RDRAM had a lot of potential.

SLAVE DRIVER

I have an NEC 3520A recordable-DVD drive configured as a slave drive on the secondary IDE channel. I'm using a LiteOn CD burner as the master. Is there a difference in performance based on which drive is the master and which is the slave?

—Edward Cheng

You'll take a performance hit only if you try to use both drives at the same time. If you record mostly DVDs, therefore, you should configure the NEC as the master drive in that chain. If you record mostly CDs, on the other hand, you should leave your configuration as is.

Continued on next page→

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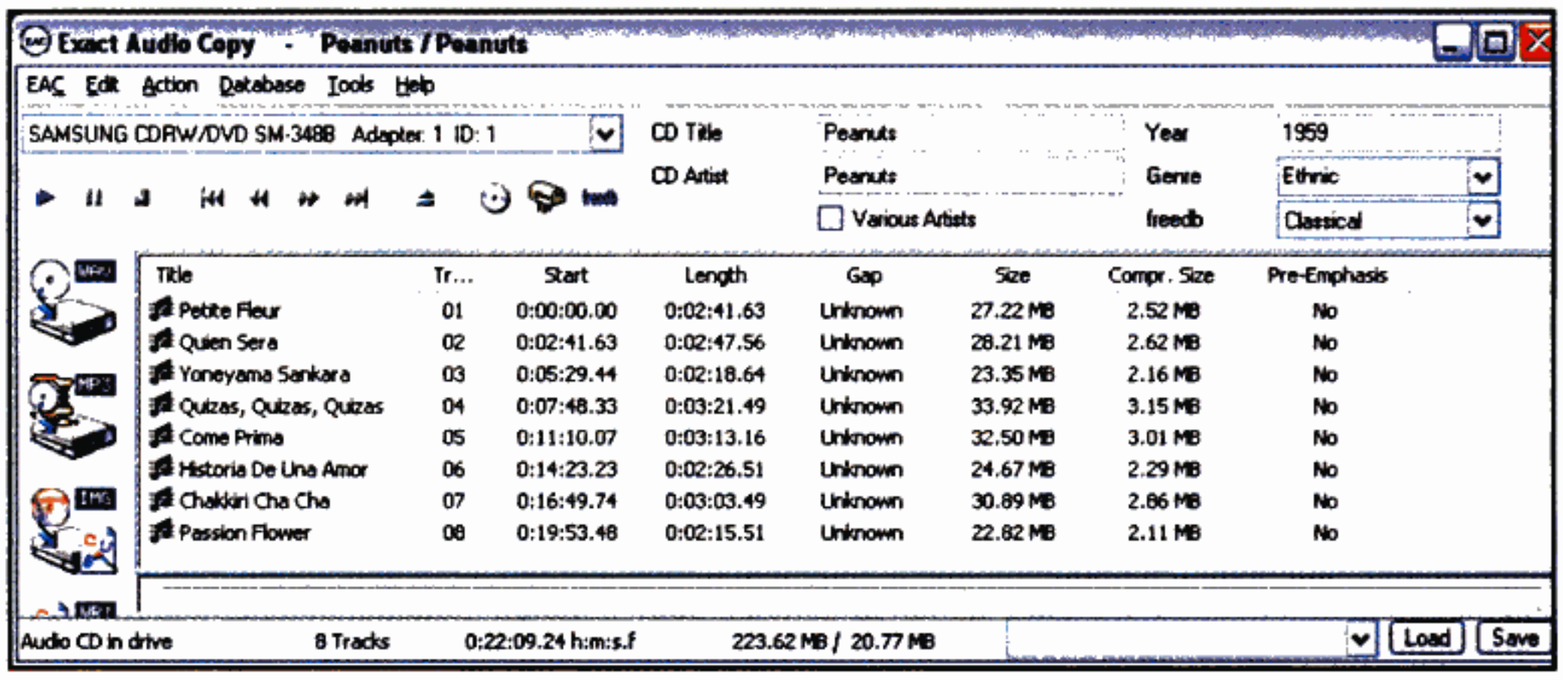
Ask the Doctor

Continued from previous page

FREEDB YOU FOR AND ME

*I've been using **Exact Audio Copy** to rip my audio CDs. I've discovered, however, that several of my CDs are not in the freedb.org database. I know you can submit updates to the database, but I just can't figure out how to do it. The part of the update process that requires the track info completely mystifies me.*

—Allan Peterson


Exact Audio Copy - Peanuts / Peanuts
EAC Edit Action Database Tools Help
SAMSUNG CDRW/DVD SM-3488 Adapter: 1 ID: 1
CD Title
Peanuts
CD Artist
Peanuts
Various Artists
Year
1959
Genre
Ethnic
freedb
Classical
Title Tr... Start Length Gap Size Compr. Size Pre-Emphasis
Petite Fleur 01 0:00:00.00 0:02:41.63 Unknown 27.22 MB 2.52 MB No
Quien Sera 02 0:02:41.63 0:02:47.56 Unknown 28.21 MB 2.62 MB No
Yoneyama Sankara 03 0:05:29.44 0:02:18.64 Unknown 23.35 MB 2.16 MB No
Quizas, Quizas, Quizas 04 0:07:48.33 0:03:21.49 Unknown 33.92 MB 3.15 MB No
Come Prima 05 0:11:10.07 0:03:13.16 Unknown 32.50 MB 3.01 MB No
Historia De Una Amor 06 0:14:23.23 0:02:26.51 Unknown 24.67 MB 2.29 MB No
Chakkiri Cha Cha 07 0:16:49.74 0:03:03.49 Unknown 30.89 MB 2.86 MB No
Passion Flower 08 0:19:53.48 0:02:15.51 Unknown 22.82 MB 2.11 MB No
Audio CD in drive
8 Tracks
0:22:09.24 h:m:s.f
223.62 MB / 20.77 MB
Load
Save

If freedb doesn't have your commercial audio CD in its database, carefully enter the disc information and upload it to this CDDB alternative.

***EAC* can be difficult to configure, but the freedb submission process is just plain quirky. Here's how to do it: First, enter the album title and the artist name in the upper right-hand corner of the application (see screenshot). Next, enter the year of publication, musical genre, and freedb genre. This information is mandatory. You'll notice that the freedb genre box has fewer choices than the other genre field. This is necessary to maintain compatibility with other applications that use freedb.**

Next, enter the track names just as you would if you were changing file names in Windows Explorer: Click the track once, wait a second and click again, and then the track name should become editable.

When you're finished, click the Database menu and choose "Submit CD Information to freedb" (or just press Alt-U). A dialog box will appear, asking if you really want to submit the information to freedb. If *EAC* tells you the track information is incompatible, try this: Change your genre selection in the freedb genre drop-down menu, and then change it back to the one you entered before. Everything should work fine now.

Freedb is particular about how track information is entered. If you're still having problems, you'll find additional formatting instructions in the freedb FAQ. Go to www.freedb.org and click the FAQ link in the main menu on the left-hand side.

HOT TO TROT

When reading forum posts about CPU cooling technologies and gadgets, I see frequent comments regarding the temperatures at which CPUs are running when carrying a full workload. I'd like to know at what temperature a CPU becomes unstable. I have an Athlon 64 4000+ in my PC, and I've been getting "Machine_Check_Exception" error messages. I suspect my problem is related to an overheated CPU, because I'm using a stock heatsink and fan. I can download software that will monitor and report my CPU temps, but that won't tell me how hot is too hot. Any suggestions?

—Adam Susser

A "Machine Check Exception" error in Microsoft Windows generally indicates system-bus trouble, memory errors, ECC issues, or problems with internal translation buffers. These are all pure hardware problems. Assuming that you've properly applied thermal paste, didn't forget to remove the plastic cover from your stock heatsink, and tried running the PC with the side-panel removed (just to make sure it's not overheating as a result of airflow obstructions), it's unlikely your problem is heat related.

If you're overclocking, the first step is to dial your CPU back to its stock clock speed while you troubleshoot the issue. Your next step is to check your motherboard manufacturer's website for an updated BIOS. Also, it can't hurt to reseat your RAM sticks and to test them using *Memtest86+* (which can be downloaded for free from www.memtest.org).

If that doesn't work, try reseating the CPU itself. You should also consider the possibility that your power supply is either undersized for your configuration, or that it's of such low quality that it's generating dirty power. The Doctor saved this step for last because the only reliable way to troubleshoot a non-obviously bad power supply (an "obviously" bad power supply being one that doesn't work at all) is to swap it out for another one and see if the problems disappear.

DVD DEATH RATTLE

I have a Sony DRU-710A DVD burner. Suddenly, and for no apparent reason, I am unable to read any kind of DVD (recordable or otherwise). I tried updating my Nero software and the drive's firmware. I ran virus scans and adware scans, and I checked the power and cables—all the typical troubleshooting steps—and yet I still cannot read my DVDs. What's even stranger is that the drive reads CDs just fine. Any ideas?

—Robert Burnham

First of all, good for you! You did everything right and in the correct order: updating the software, updating the firmware, running system scans, and checking cable connections. Unfortunately, this leads the Doctor to a fairly certain diagnosis that the problem is with the drive itself. Hopefully, the drive is still under warranty, and you retained your receipt.

DISC DISMISSED

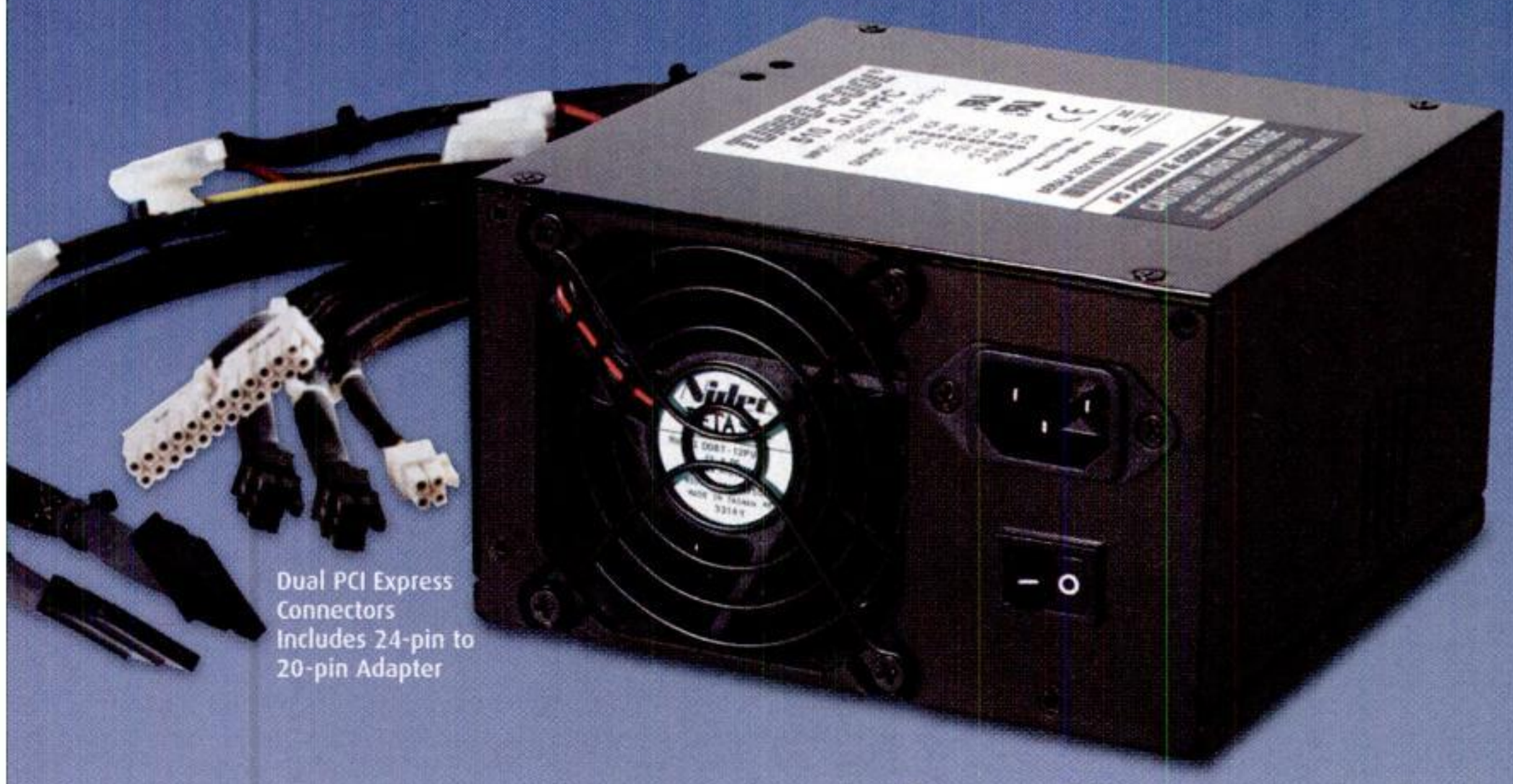
I recently burned a DVD-Video with Nero, but I had to reduce the bit rate in order to fit the contents onto a 4.7GB recordable DVD. My DVD burner supports double-layer disc burning, so I figured I could get better quality with a double-layer recordable DVD, which I purchased for almost $10. Unfortunately, there was an error during the process, and now I can't write to my double-layer disc anymore. Is the disc ruined?

—Solidus Kal

Continued on page 60→

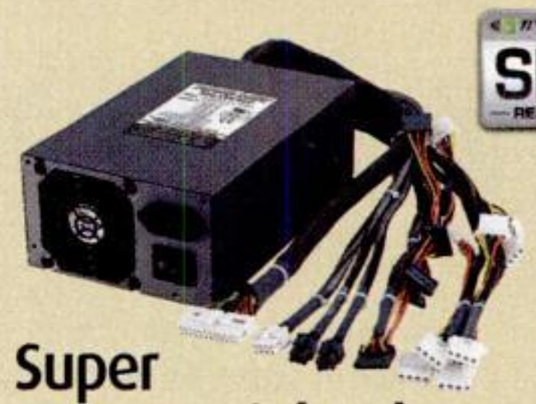
Is your dream machine turning into a nightmare? Are you waking up in a cold sweat because your PC can't cope with today's hardware? Look to the west, my sons and daughters, for the Doctor is here to save you. Email all your PC problems to **doctor@maximumpc.com.**

Heavyweight Champ.



Turbo-Cool®510 Express/SLI

NEW TECHNOLOGY SPOTLIGHT



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- Ultra-Tight Regulation (+VDC@1%)
- Amazingly Quiet Cooling System
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Ask the Doctor

Continued from page 58

In a word, yes. You want to be very careful when burning to expensive double-layer media. The Doctor recommends shutting down any other applications and steering clear of your PC during any double-layer disc burn.

But you might want to ask yourself if it's really necessary to use the pricey double-layer media in the first place. These steps will help with your decision: Create your high bit-rate DVD again, exactly as you did the first time you burned it to a single-layer disc; but instead of burning it to a disc, burn it to a folder on your hard drive using *Nero's* "Write to Hard Disk Folder" option. *Nero* will ask where you want to put the VIDEO_TS folder it will create. Make a new folder with a descriptive name, and point *Nero* to that folder. Repeat these steps to create a second DVD at the lower bit rate.

Once you've created your videos, use your DVD-player application to view each movie from your hard drive. If you're using *Nero Showtime*, right-click the open window, choose Select Source from the menu, click "Play from folder," and navigate to the VIDEO_TS folder. Play back both versions and determine how much quality you're losing by recording at the lower bit rate. Given *Nero's* high-quality transcoder, you just might discover that the difference is barely perceptible.

Windows Security Center
Security Center
Help protect your PC
Resources
Get the latest security and virus information from Microsoft
Check for the latest updates from Windows Update
Get support for security-related issues
Get help about Security Center
Change the way Security Center alerts me
Security essentials
Security Center helps you manage your Windows security settings. To help protect your computer, make sure the three security essentials are marked ON. If the settings are not ON, follow the recommendations. To return to the Security Center later, open Control Panel.
What's new in Windows to help protect my computer?
Firewall
ON
Automatic Updates
OFF
Automatic Updates is turned off. Your computer is more vulnerable to viruses and other security threats. Click Turn on Automatic Updates to have Windows automatically keep your computer current with important updates. How does Automatic Updates help protect my computer?
Turn on Automatic Updates
Alert Settings
Security Center
Alert Settings
Firewall
Alert me if my computer might be at risk because of my firewall settings
Automatic Updates
Alert me if my computer might be at risk because of my Automatic Updates settings
Virus Protection
Alert me if my computer might be at risk because of my virus protection software settings
OK
Cancel
At Microsoft, we care about your privacy. Please rea

Tired of being pestered by the Windows Security Alert bubble? Use the Security Center control panel to shut it off.

SECOND OPINION

I agree with your assessment of Andrew Schmidt's audio-noise problems (July 2005); however, I've experienced similar problems with my Audigy 2 soundcard and I thought I might share my experience. I traced the source of my noise problem to the optical drive's audio cable—when I muted CD audio via the audio mixer, noise was reduced by more than 90 percent. I concluded that the problem was either a faulty audio cable or the result of wrapping my CD-audio and DVD-audio cables together in the same sleeve.

Another way to reduce—if not eliminate—audio noise is to install a ground-loop isolator inline between the computer and the amplifier (or amplified speakers, as the case may be). A ground-loop isolator will help reduce interference caused by poorly grounded outside electrical components.

—John Veurtjes

ENOUGH ALREADY!

Is there any way to disable the nagging little Windows security bubble that pops up every time I disable the Windows firewall or turn off my anti-virus program? The executable name is "wscntfy.exe."

— Bill Price

This is the Windows Security Notification, which is part of Windows XP SP2. It will not only nag you whenever you shut down your firewall or antivirus software, it will bug you if Windows doesn't happen to recognize whatever security software you are using. Fortunately, there's any easy way to get rid of it.

Double-click the Windows Security Alerts icon in the Taskbar to open the Windows Security Center. Click the menu item that reads "Change the way Security Center alerts me," in the left-hand menu. When the dialog box opens, remove the checkmarks next to firewall and virus protection. If you don't want to be pestered about automatic updates, remove the checkmark next to this item, too. If you turn off all three alerts, the icon will disappear from the Taskbar. If you decide to turn any of them back on, you'll need to access the Windows Security Center from the Control Panel.

FLASH DANCE

I own a Dell desktop PC, and I'd like to know if it's a good idea to flash the BIOS with the chipset manufacturer's BIOS, or if I should continue using the one that Dell offers. It seems to me that Dell's BIOS updates don't provide all the options and features you might find in the chipset manufacturer's firmware.

—Jesse Peterson

If you're thinking about using a BIOS that's not made specifically for your motherboard, the Doc has one word of advice: *Don't.* You don't want to risk nuking the board by flashing the BIOS with an incompatible update. Dell generally uses customized motherboards that feature specific engineering modifications. There might be some older Dell machines that use off-the-shelf mobos, but those would have been manufactured a long time ago. Stick with the BIOS from the board maker. MPC

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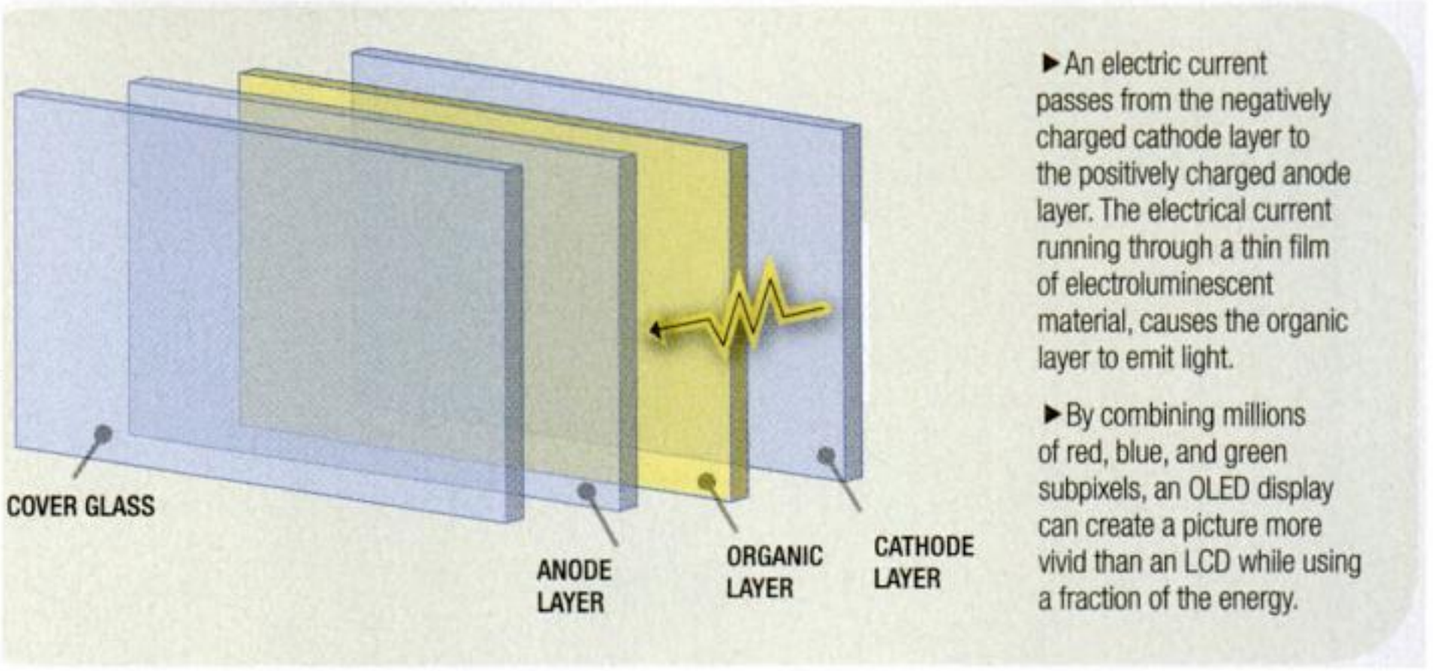
White Paper: Organic LEDs

LCD and plasma displays look great, but they could become a thing of the past if OLED (organic light-emitting diode) technology delivers on its promise. With brighter, more vivid images, and no backlight, OLED could take over

BY TAE **KIM**

INSIDE OLED **How each pixel in an OLED works**


COVER GLASS
ANODE LAYER
ORGANIC LAYER
CATHODE LAYER
▶An electric current passes from the negatively charged cathode layer to the positively charged anode layer. The electrical current running through a thin film of electroluminescent material, causes the organic layer to emit light.
▶By combining millions of red, blue, and green subpixels, an OLED display can create a picture more vivid than an LCD while using a fraction of the energy.

In the late 1970s, scientists at Eastman-Kodak discovered organic materials that glow in response to electrical current, but the company didn't publish its findings until 1987. This research forms the basis of organic LED (OLED) technology. Thanks to the growing popularity of thin-profile monitors and televisions, the exploding demand for handheld displays, and OLED's superior color, brightness, and power-consumption properties, OLED is poised to become a major competitor to LCD and plasma display tech.

OLED research has branched in two major directions: small molecules and polymers (or long molecules). To construct a small-molecule OLED, a thin film of organic material must be laid down using a vacuum-deposition process. Because this doesn't scale well with larger applications, most OLED displays to date have been designed for handheld devices, such as digital cameras, PDAs, and MP3 players.

It may not be long before an OLED display like this Samsung prototype occupies your desktop.

Cambridge Display Technology has done much of the early long-molecule research and development, variously known as light-emitting polymers and polymer light-emitting diodes (PLEDs). The thin-film organic layer of these displays can be laid down using an inkjet printer, which renders them better suited to the manufacture of large displays. PLED displays can be radically thinner, too; in fact, some companies are working on PLED displays that can be rolled up like a newspaper. Unless otherwise noted, the rest of this discussion will apply to both small-molecule OLEDs and PLEDs.

OLED: THE BASICS

An OLED display consists of three layers of material arranged in a thin sandwich: A negatively charged layer, called the cathode, is placed atop a substrate material; electroluminescent organic material is placed in the middle; and a positively charged layer, called the anode, is placed on top. When electrical voltage passes from the cathode to the anode, it courses through the organic material, causing it to emit visible light. The wavelength of the light, which determines its color, depends on which organic material is stimulated: some diodes emit red light, others green, and still others blue light. Individual diodes can be selectively and rapidly turned on or off to create an image.

As with LCD displays, OLED displays come in two categories: Passive matrix and active matrix. In a passive-matrix display, each row and column of pixels is controlled by its own electronic driver. As the numbers of rows and columns increase, a passive-matrix OLED requires more and more power to stimulate its thin organic film. This renders passive-matrix displays best suited to small devices.

The pixels in an active-matrix OLED display are deposited on top of a thin-film transistor (TFT). Unlike the passive-matrix display, where electricity is distributed row by row, an active-matrix's TFT backplane serves as an array of switches that control the amount of current flowing through each pixel. This design greatly reduces the display's overall power consumption; although, both types of OLEDs are considerably more power efficient than LCDs.

ADVANTAGES OF OLED DISPLAYS

Because the organic material inside an OLED is naturally luminescent, OLED displays don't require a backlight. This not only reduces their power consumption in comparison to an LCD, it also enables them to display a true black. Because black is characterized by the absence of light, an OLED can easily display black by not stimulating selected pixels. LCDs can't turn off select areas of their backlight, instead, chemical shutters in the LCD block the backlight on a per-pixel basis, with some inevitable leakage.

OLED pixels turn on and off as rapidly as a light bulb, which makes them well suited for video, animation, and games. OLED

Copyrighted material

displays don't exhibit any of the smearing problems that plagued early LCDs. The brightness and high contrast of an OLED display make it viewable from almost any angle, unlike LCDs, which are difficult to see when viewed off axis. Add in the aforementioned flexibility a PLED display can offer, and you have the makings of an incredible new type of video monitor.

OLED'S WEAKNESSES

No technology is perfect and OLED has its shortcomings. OLED displays are particularly susceptible to water—and even oxygen—intrusion, which destroys the organic material inside. This makes for a tricky manufacturing process, and the displays must be tightly sealed to prevent air and water penetration after they've been put into service.

OLED displays also have limited lifespans. The electrical current passing through the organic material causes the material to decay over time. Red and green electroluminescents have relatively long half-lives, but manufacturers have had more difficulty finding long-lasting substances that emit blue light. Progress continues, however: In May, Cambridge Display Technology announced the development of a blue OLED with a lifespan of 100,000 hours.

WHAT'S NEXT?

In terms of market penetration, OLED displays of all sizes lag far behind LCDs, CRTs, and even plasma. Most OLEDs now on the market exist in small devices, such as cellphones, digital cameras, and PDAs. OLED televisions and computer monitors have been developed, but these remain in the prototype stage.

Because Kodak conducted much of the pioneering research in OLED technology, the company owns a deep well of fundamental patents. The need to license this intellectual property has discouraged many other companies from entering the market. Kodak's earliest patents are now beginning to expire, however, so this should quicken the industry's R&D pace.

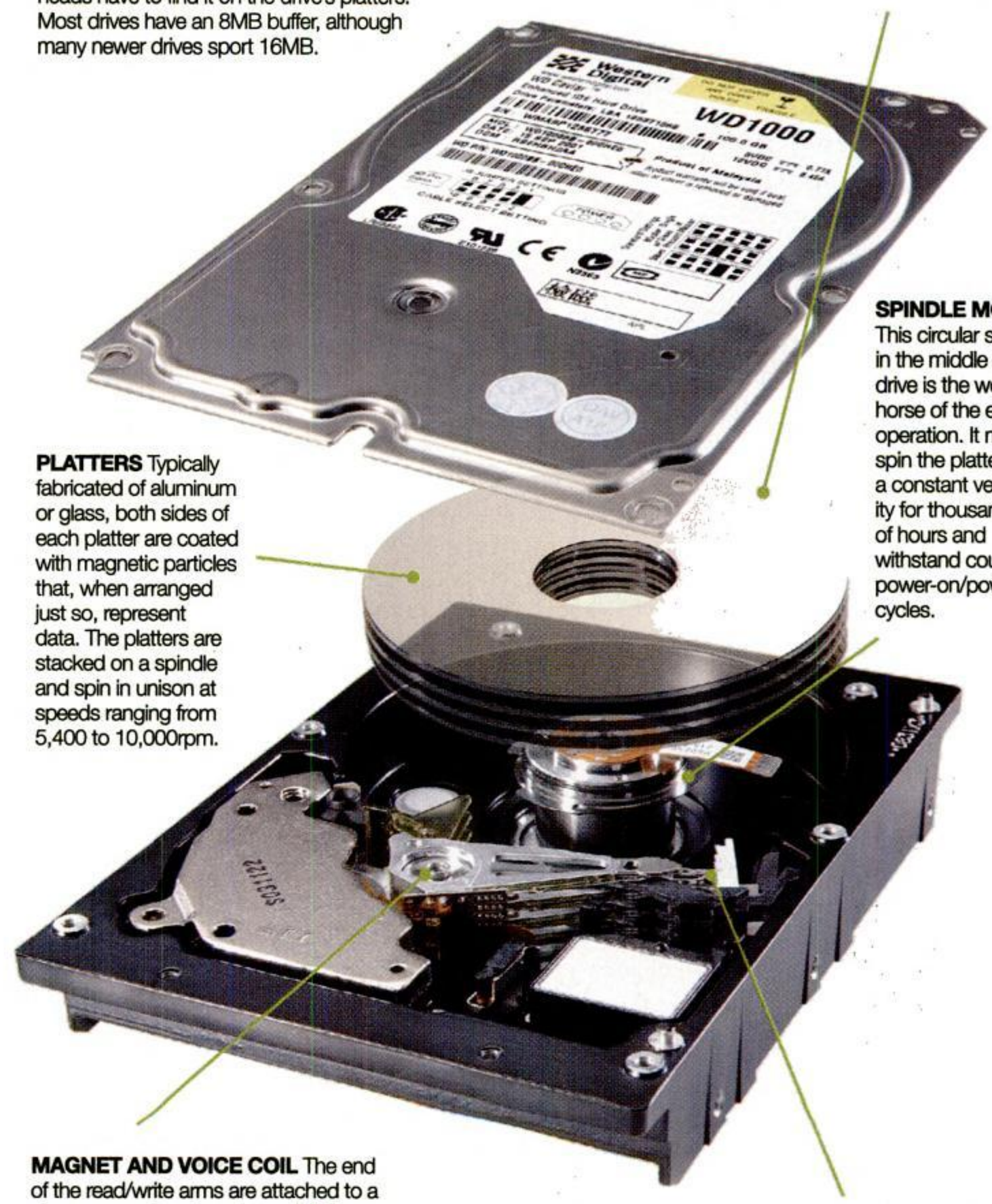
Barring major setbacks, we predict OLED will supplant LCD, plasma, and CRT as the favored technology for displays of all sizes before the end of the decade. PLED displays are particularly exciting. Imagine rolling up your monitor and stashing it in your backpack, reading email on a screen that's sewn into your clothing, or subscribing to a newspaper that you never throw away because it can automatically refresh its own content by downloading it from the web. These scenarios aren't as far fetched as they might sound. OLED will make them possible. MPC

Anatomy of a Hard Drive

Your hard drive looks boring on the outside, but peel back its unassuming cover and you'll discover technology that's breathtakingly beautiful

BUFFER A cache of local memory in which the most recent data read from the hard drive is stored. If the computer requests the same data again and it's still resident in the buffer, it can be delivered from here much faster than if the read heads have to find it on the drive's platters. Most drives have an 8MB buffer, although many newer drives sport 16MB.

HEAD-LANDING ZONES These are tracks on the disk that contain no data. When the drive spins down, the read/write heads gently land on these surface areas, which are engineered to withstand contact during landing and takeoff maneuvers.



PLATTERS Typically fabricated of aluminum or glass, both sides of each platter are coated with magnetic particles that, when arranged just so, represent data. The platters are stacked on a spindle and spin in unison at speeds ranging from 5,400 to 10,000rpm.

SPINDLE MOTOR This circular shaft in the middle of the drive is the workhorse of the entire operation. It must spin the platters at a constant velocity for thousands of hours and withstand countless power-on/power-off cycles.

MAGNET AND VOICE COIL The end of the read/write arms are attached to a strong magnet and a voice coil. When a charge is supplied to the voice coil, it creates a magnetic field that uses electromagnetic attraction and repulsion to move the read/write head over the platters extremely quickly.

READ/WRITE HEAD ASSEMBLY These tiny arms extend over both sides of each platter to read and write data. The heads glide over the platters at speeds in excess of 50mph on a cushion of air just 15 nanometers thick.

LOGIC BOARD Located beneath the drive, this printed circuit board serves as an interface between the host bus adapter and the operating system. When these PCBs first appeared on drives, they became known as IDE (integrated drive electronics).

Preview

Sound Blaster X-Fi

An exclusive first look at Creative Labs' promising new soundcard

In an age of powerful dual-core CPUs, oodles of memory, and motherboards with integrated multichannel surround sound, does anyone really need a soundcard? Based on what we've seen—and heard—of the Sound Blaster X-Fi so far, we think the answer is "absolutely!"

—MICHAEL BROWN

BEYOND THE AUDIGY 2

Creative Labs wasn't the first manufacturer to build a PC soundcard, but no company has been more active in this market segment. In the four years since Creative last introduced an entirely new audio architecture, Intel, nVidia, and other chipset manufacturers have done their level best to render the soundcard an anachronism by integrating multichannel audio into the motherboard.

Based on our exclusive first look at a prototype of Creative's Sound Blaster X-Fi card, we see the potential for interactive audio in games, movies, and music that will be like nothing you've ever heard. We discuss the X-Fi's hardware specs in our Dream Machine coverage (page 22), so we'll focus our attention here on Creative's all-new 3D-audio rendering engine.

EAX ADVANCED HD 5.0

With EAX 4.0, game developers could simulate the acoustic characteristics of multiple environments simultaneously, so that audio events match the acoustics of the space in which they occur. Version 5.0 will tap the X-Fi's horsepower to significantly expand this capability. The new audio engine will support up to 128 simultaneous 3D sound sources and as many as four reverberation processes simultaneously.

EAX PurePath will provide full control over multichannel routing and panning to individual speaker channels. This will enable the producer of a game's soundtrack to not only assign specific audio events to specific speakers, it will also enable the sounds to migrate from one speaker to another as the player—or the sound's source—moves around in the game environment.

Fans of multiplayer games that support voice chat will appreciate EAX 5.0's Microphone Environment FX control feature. This technology will feed the PC's microphone input to the EAX engine so that players' voices are processed to match the environment in which their game character resides. In games that support the spatialization of remote players' voices, each player's voice will now appear to emanate specifically from the character they're controlling, and the sound of their voices will be affected by the game environment they're in.

Creative expects to ship the X-Fi in early September. Pricing had not been established at press time.

Unlike previous Sound Blasters, the X-Fi will be able to process audio from any source (host memory, line-in, microphone...); in any format (MP3, WMA, DVD...); and at any sample rate (up to 192kHz).

FIRST LOOK

STICK AN IPOD IN YOUR WALL

New solutions for integrating iPods into home-entertainment systems

Hate reaching behind your A/V receiver every time you want to listen to your iPod in your living room? Install an iPort In-Wall docking station from Sonance (**www.sonance.com**) and you can pipe music to your hi-fi system in an instant. A video output, meanwhile, enables you to display pictures from your iPod Photo on a connected television monitor.

The original iPort was targeted at the custom-installer market, but the company recently announced five new models that it promises are simple enough for the do-it-yourself crowd to handle. If you can install an electrical outlet or a light switch, you should be able to install an iPort—just make sure you're comfortable cutting holes in your walls and stringing electrical, video, and audio cable.

Each of the new iPort models features an ingenious universal docking bay that automatically conforms to the shape of any current hard drive–based iPod. The base model IW-1 ($200) consists of an in-wall housing with a fixed feature set: It charges your iPod while it's docked, and it outputs unbalanced audio and video for local-room applications. You control the iPod using the buttons on its faceplate.

The iPort model IW-2 ($350) adds an integrated infrared receiver and features a two-piece design: The in-wall housing with a snap-in faceplate containing the universal docking system, plus a modular motherboard that can accommodate plug-in expansion cards. iPort plans to develop cards for balanced audio output ($275), balanced video output ($325), and two-way communication via RS-232 ($225).

Using balanced connections and shielded Cat-5 cable will enable long-distance audio and video cable runs (500 feet for audio; 250 feet for video). RS-232 communication allows the system to display the iPod's metadata (playlists, track, artist, and album name) on a remote video display. iPort will also offer models with these expansion cards preinstalled: The iPort IW-3 ($600) will provide integrated IR and balanced audio; the iPort IW-4 will add these features, plus RS-232 connectivity; and the iPort IW-5 ($1,100) will include everything that the IW-4 has, plus the balanced-video module.

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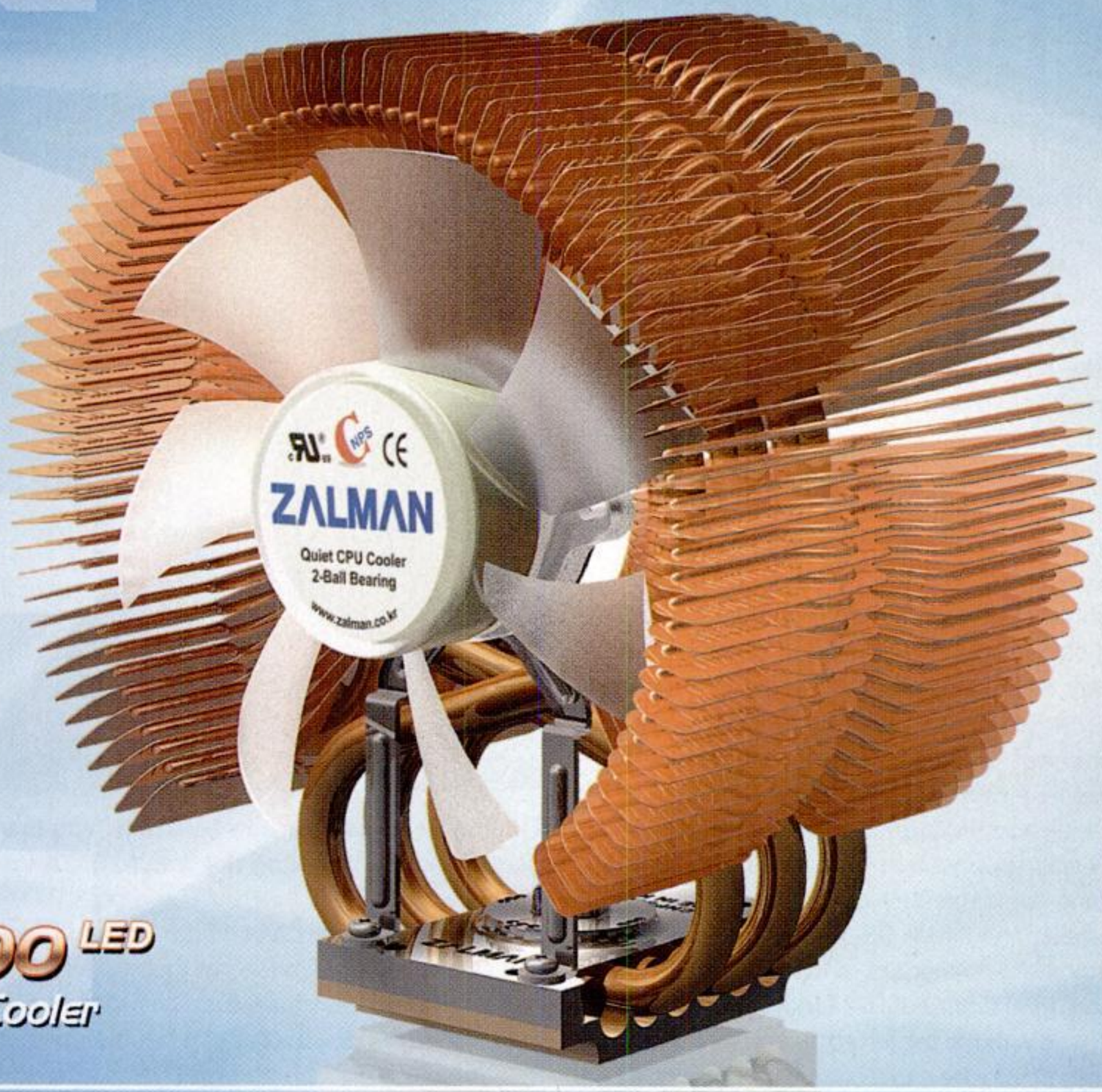
Endless Innovations

ZALMAN

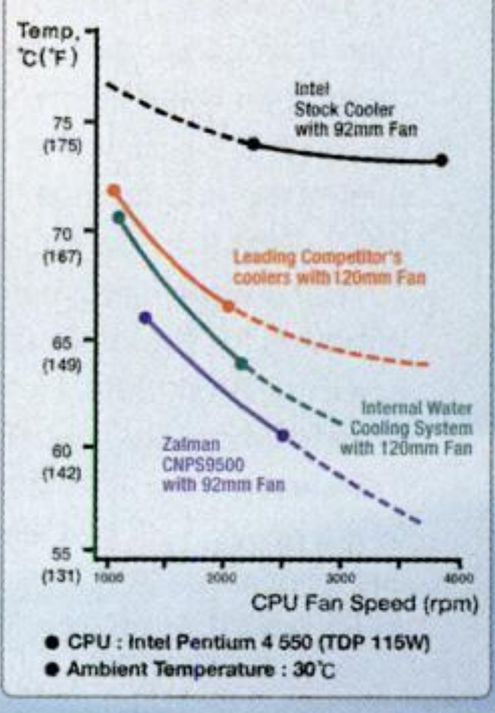
The Art of Cooling Redefined



CNPS 9500 LED

Ultra Quiet CPU Cooler

Performance Comparison Chart



- CPU : Intel Pentium 4 550 (TDP 115W)
- Ambient Temperature : 30℃

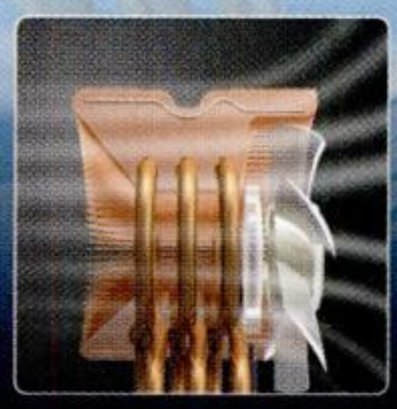
● Ultimate Perfomance

100% copper heatsink with aerodynamically optimized "tunnel" design for maximum cooling efficiency

Innovative patented heatpipe bending design for a heat transfer capability equal to 6 heatpipes with just 3 heatpipes

● Ultra Quiet Operation

Ultra Quiet CNPS 92mm opaque fan with blue LEDs



Aerodynamically optimized heat sink for smooth airflow and minimal noise

● Minimized Weight

Optimized heatsink layout for maximum cooling efficiency with minimal materials

0.2mm ultra slim fins for miniminzed weight and reduced airflow resistance

● Broad Compatibility

Intel Pentium 4 (Socket 775/478)

AMD Sempron/AMD64 (Socket 754/939/940)

Specifications

Dimensions (L X W X H)	85 X 112 X 125 mm (3.35 X 4.41 X 4.92 inch)
Heatsink Material	Pure Copper Base Pure Copper Fins Pure Copper Heatpipes
Weight	498g (17.56oz)
Dissipation Area	3,498cm² (542.19 inch²)
Fan Size	92 X 25 mm (3.62 X 0.98 inch)
Fan Operating Voltage	5~12V
Rated Current	0.35A
Max. Power Consumption	4.2W
Bearing Type	2-Ball Bearing
Fan Speed	1,350 - 2,600rpm ±10%
Noise Level	18.0 - 27.5dB ±10%
Connector	3-Pin
Fan Speed Controller	FAN MATE 2

CNPS COMPUTER NOISE PREVENTION SYSTEM

[Zalman Tech Co., Ltd.] #1007 Daeryung Techno Town, 448 Gasan-dong, Gumchun-gu Seoul, Korea / Tel : +82-2-2107-3232, Fax : +82-2-2107-3322 / E-mail : zalman@zalman.co.kr / Homepage : http://www.zalman.co.kr
[Zalman USA, Inc.] 10531 Garden Grove Blvd., Garden Grove, CA 92843, U.S.A. / Tel : 1-714-530-0700, Fax : 1-714-530-0707 / E-mail : zalman@zalmanusa.com / Homepage : http://www.zalmanusa.com

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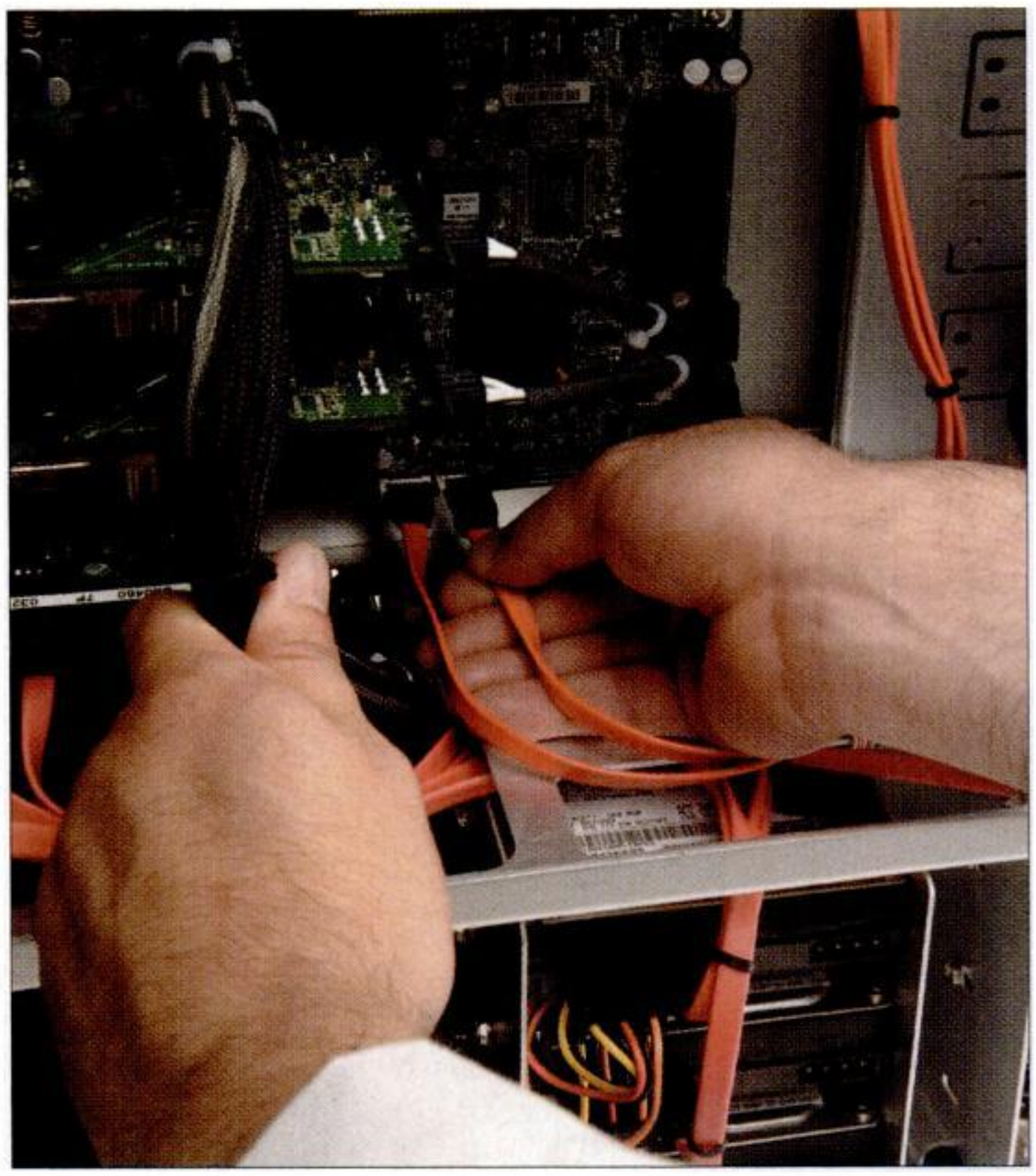
Gordon Mah Ung

Tackles DMX

Building a quad-core Dream Machine was easier than I thought it would be, but there were still problems



Tidying SATA cabling can be tricky. You have to be extremely gentle, or risk breaking the fragile SATA connectors.

Deep in my heart, I know that the PC is a mature platform, but sometimes I forget. When I was planning the dual-Opteron Dream Machine, I feared the worst—no booting, hardware incompatibilities, etc. I was shocked when it all worked. I took a boatload of untested (and some pre-release) components, crammed them into a mammoth aluminum case, and the machine booted with the first flick of the power switch.

OK, it wasn't quite that easy. The first time I tried to POST the Tyan K8WE outside of the case, the board wouldn't boot. I isolated the problem—an incompatibility between the dual-core procs and the original BIOS. It was a pain in the ass to fix. I had to remove the dual-cores and replace them with a single-core Opteron to flash the BIOS. With the new BIOS, the board was up and running in no time.

But it wasn't long before I was faced with another dilemma: Windows XP Professional x64-bit Edition wouldn't see more than 2.5GB of RAM. Sure, I knew all about Windows XP Pro's issues with large RAM configs, but x64 was supposed to work fine, right? Well, it did, eventually. After making some memory-configuration changes to the K8WE's BIOS, I reinstalled the 64-bit OS, and it was able to see all 8GB of RAM. Unfortunately, no amount of tweaking could get Windows XP Pro to see more than 2.5GB of RAM.

The final snag I ran into was with the oversized Turbo Cool 850. This extended PSU just barely fit into the case, but it was well worth the effort. The power consumption of two dual-core CPUs with two videocards in SLI and five hard drives is more than the average 500-watt PSU can handle.

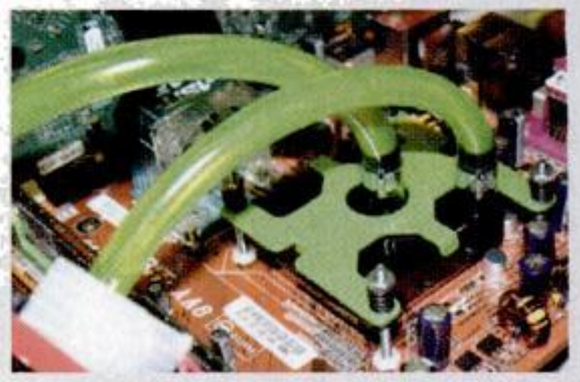
Prior to building DMX, I hadn't spent much time running SATA cables and I was surprised at their inflexibility. Luckily, the new design of the Silverstone case provides multiple paths for routing the unwieldy wires, and after a couple minutes, I was able to get the five-cable bundle from the RAID controller to the hard drives while keeping the entire collection out of sight.

Still, DMX was easy to build—especially when I think back on the near-debacles of Dream Machines past.

Josh Norem

REVISITS CORSAIR COOL

I wanted to know if my original results could be duplicated



This month I retested Corsair's Cool water-cooling kit to determine its potential for overclocking.

Back in May, I tested several water-cooling kits ("Chilling Out With Water Cooling"), including the Cool CWC100-1001 kit from Corsair. At that time, the Corsair Cool was able to achieve exemplary temperatures on our LGA775 test platform, but this stellar cooling performance didn't carry over into my overclocking experiments. Using the Cool kit, I could only overclock the test rig 5MHz beyond the mark that the stock Intel heatsink/fan hit.

Corsair was puzzled by the performance disparity—usually low CPU temperatures make for good overclocking—and asked me to retest its kit. Unfortunately, the Abit Fatality AA8XE mobo we used as the original test platform died during testing. My current cooling test platform is the Abit AA8 motherboard with the same Socket 775 Pentium 4 3.6GHz CPU used in the original tests. I strapped the Corsair kit onto my test bed and fired it up.

Using the new test bed, I was able to overclock the holy schnikies out of the 3.6GHz CPU, ratcheting it all the way up to 4.25GHz—the same speed I achieved using the Asetek WaterChill kit in the July issue. It's worth mentioning that the Acetek kit uses a radiator that's three times the size of the Cool's unit. Not bad at all.

It's not a perfect apples-to-apples comparison because I couldn't retest the Corsair kit on the exact same platform I used before. But the Cool's performance on my new test platform indicates that it's a better kit for overclockers than my previous testing showed.

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How We Test

You live in the real world. Your benchmarks should too

PC performance used to be measured with synthetic tests that had little or no bearing on real-world performance. Even worse, when hardware vendors started tailoring their drivers for these synthetic tests, the performance in actual games and applications sometimes dropped.

At *Maximum PC*, our mantra for testing has always been "real-world." We use tests that reflect tasks power users perform every single day. With that in mind, here are the six real-world benchmarks that we use to test every system we review.

SYSmark2004: This is the most comprehensive application benchmark available, using no fewer than 19 applications to measure the time it takes for the PC to complete to real-world computer-intensive tasks. Our *SYSmark* score is a composite based on the time the test takes to complete several different types of tasks.

Adobe Premiere Pro: The leading nonlinear digital-video editor has recently been retooled with more support for multi-threading. We take a raw AVI file, add several transitions and a soundtrack, export it to a generic MPEG-2 file, and then report the time the script takes to complete.

Adobe Photoshop CS: We don't subscribe to Apple's half-baked idea that running one filter test in *Photoshop*, in one certain way, at a particular time of day provides an accurate measure of performance. Instead, we take a high-resolution image and throw it through just about every filter available in *Photoshop CS* at it. Our score is the time it takes for the script to complete.

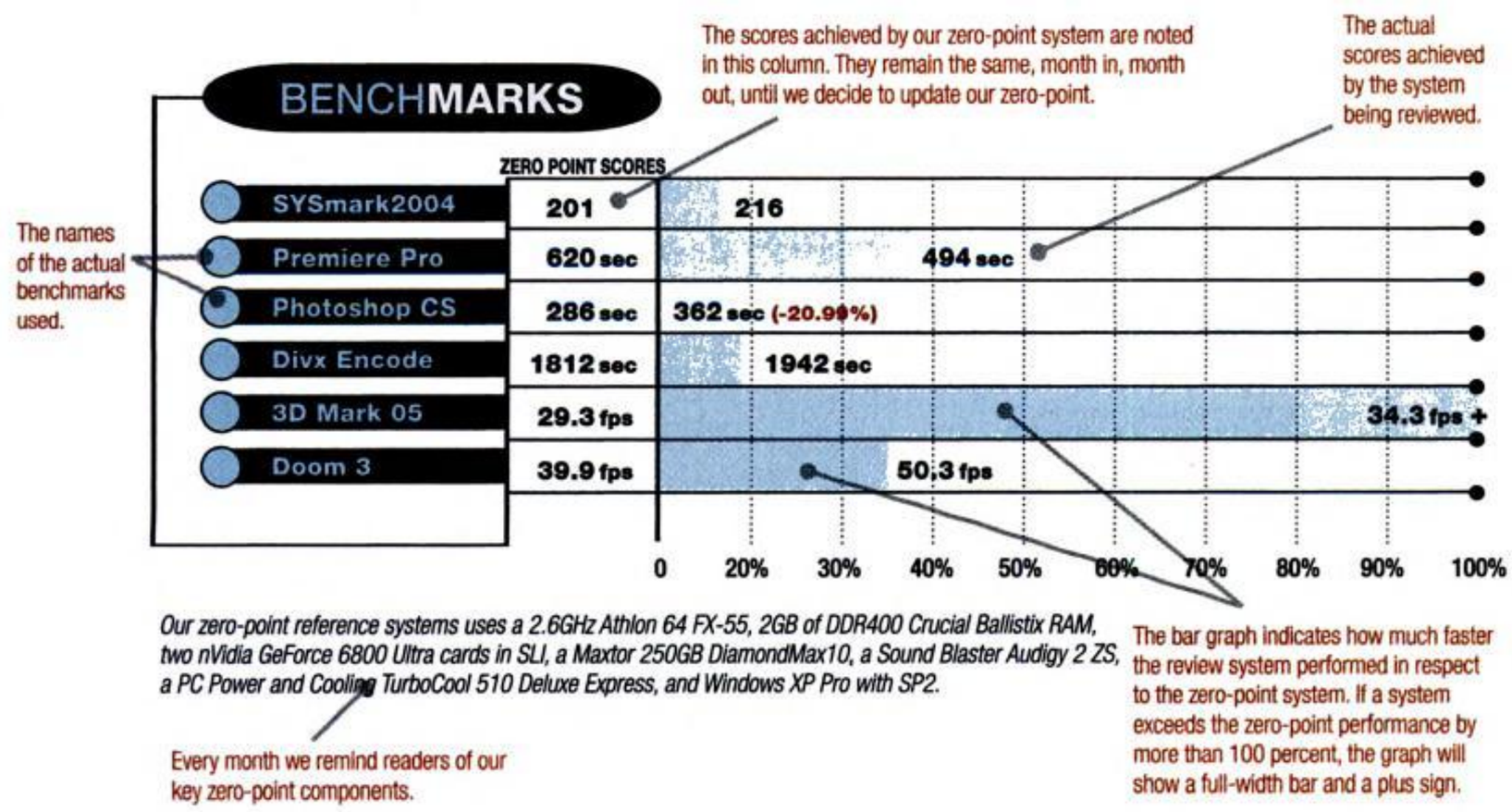
Divx Encode: Video encoding is today's time-suck. We transcode a short movie stored on the hard drive from MPEG-2 to Divx using *#1 DVD Ripper.* We report the length of time the process takes to complete.

3DMark05: After ranting about real-world tests, you might be surprised to find this "synthetic" graphics test in our suite. *3DMark05*, however, has proved to be the standard by which graphics cards and PCs that run them are judged. Instead of reporting a meaningless composite score, we run the third test at 1280x1024 with 4x antialiasing and 4x anisotropic filtering, then report the frame rate. Our zero-point system with SLI can't even break 30 frames per second.

Doom 3: Id's hugely popular game is a dark, scary, and serious test of PC horsepower. We run this game with 4x antialiasing and 4x anisotropic filtering, at 1600x1200 resolution, and report the frame rate.

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart


The scores achieved by our zero-point system are noted in this column. They remain the same, month in, month out, until we decide to update our zero-point.
The actual scores achieved by the system being reviewed.
BENCHMARKS
ZERO POINT SCORES
The names of the actual benchmarks used.
SYSmark2004
201
216
Premiere Pro
620 sec
494 sec
Photoshop CS
286 sec
362 sec (-20.99%)
Divx Encode
1812 sec
1942 sec
3D Mark 05
29.3 fps
34.3 fps +
Doom 3
39.9 fps
50.3 fps
0
20%
30%
40%
50%
60%
70%
80%
90%
100%
Our zero-point reference systems uses a 2.6GHz Athlon 64 FX-55, 2GB of DDR400 Crucial Ballistix RAM, two nVidia GeForce 6800 Ultra cards in SLI, a Maxtor 250GB DiamondMax10, a Sound Blaster Audigy 2 ZS, a PC Power and Cooling TurboCool 510 Deluxe Express, and Windows XP Pro with SP2.
Every month we remind readers of our key zero-point components.
The bar graph indicates how much faster the review system performed in respect to the zero-point system. If a system exceeds the zero-point performance by more than 100 percent, the graph will show a full-width bar and a plus sign.

Our monthly category-by-category list of our favorite products. New products are in red.

High-end videocard:
GeForce 7800 GXT

Budget videocard:
ATI Radeon X800XL

Soundcard:
With the X-Fi due this fall, you should wait on buying a new soundcard

7,200rpm SATA:
Hitachi Deskstar 7K500

External backup drive:
Western Digital Dual-Option Media Center 250GB

Portable USB drive:
Seagate Portable External Hard Drive 100GB

DVD burner:
Plextor PX-716A

Widescreen LCD monitor:
Dell 2405FPW
A nearly flawless 24-incher for less than $1K!

Desktop LCD monitor:
Dell 2001FP

Desktop CRT monitor:
NEC FE2111 SB

Socket 939 Athlon 64 mobo:
Asus A8N-SLI Deluxe

Socket 775 Pentium 4 mobo:
We're still holding out on a Pentium mobo recommendation

Portable MP3 player:
Apple iPod 60GB

Photo printer:
Canon i9900

5.1 speakers:
Logitech Z-5500 Digital

2.1 speakers:
Klipsch GMX A2.1

Mid-tower case:
Cooler Master Praetorian 730
The Praetorian is a sequel to the beloved Wave Master and is simply cooler than the Chenbro Gaming Bomb II that it supplants

Full-size case:
Thermaltake Armor VA8000SWA

Our current gaming favorites:
Battlefield 2, Grand Theft Auto: San Andreas, World of Warcraft

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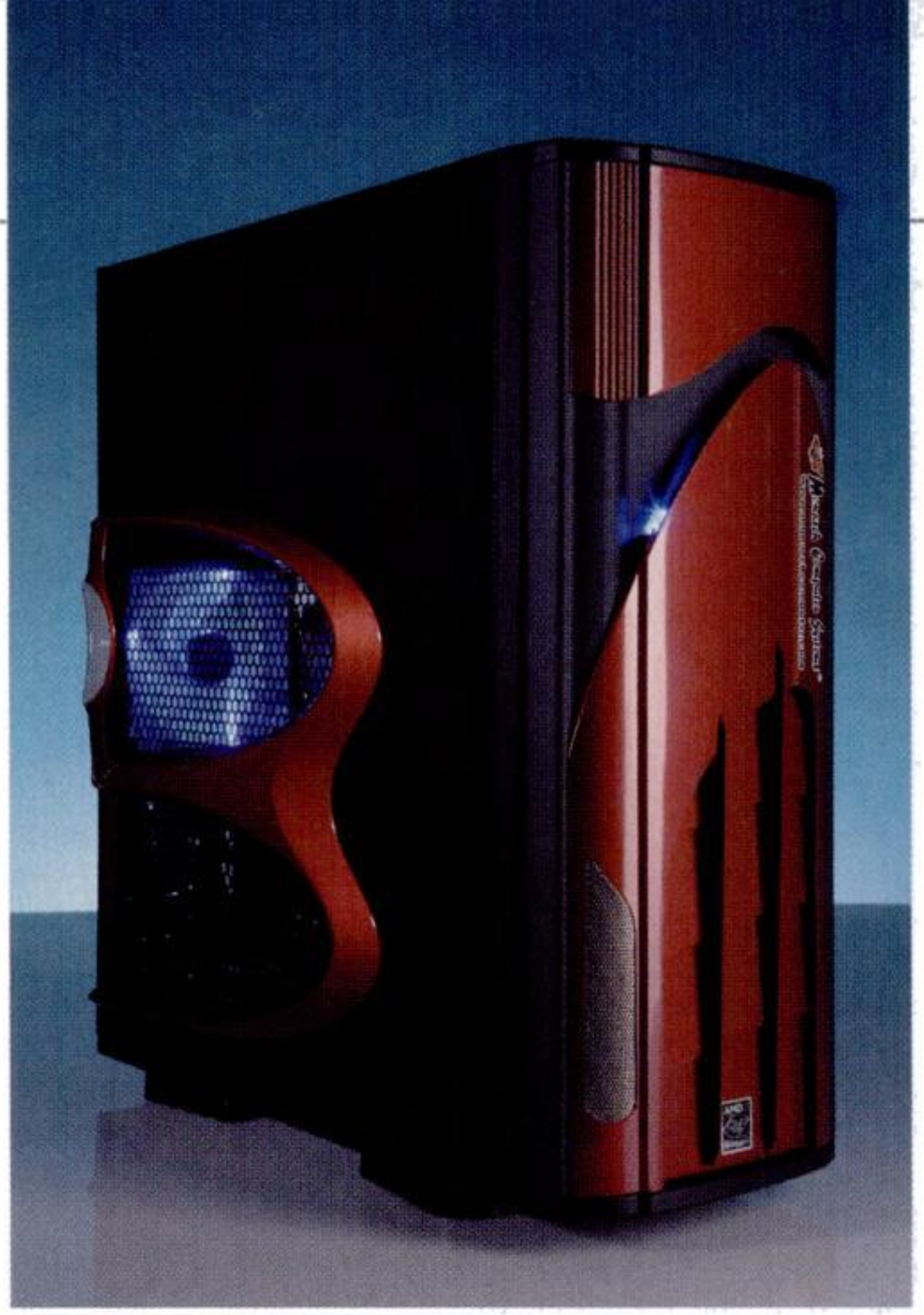
Monarch Nemesis

Run-of-the-mill PCs are this system's mortal enemy



The Monarch Nemesis is a tour de force of next-gen AMD and nVidia hardware.

Although Monarch Systems has been in the PC-building business for a long time, the company is best known for its small-formfactor machines. But we wanted to see if Monarch had the chops to build a lust-worthy full-size machine. The company proved worthy by sending one monster of a desktop system—the Nemesis—which happens to be the first computer outfitted with AMD's Athlon FX-57 CPU to roll into our Lab.

The FX-57 represents a move to AMD's 90nm "San Diego" CPU core, and it boasts a clock-speed bump from 2.6 to 2.8GHz, support for SSE3 instructions, and a tweaked on-die memory controller. But the FX-57 isn't the only new part occupying the roomy confines of the custom-painted Thermaltake Shark case: Monarch has plugged in two brand-spanking-new nVidia GeForce 7800 GTX videocards in SLI—another first for us (aside from those in the Dream Machine, of course). Each of these wonder twins features a core clock speed of 430MHz and 256MB of GDDR3 RAM clocked at 600MHz. There are a lot of horses pulling this buggy.

Monarch chose Asus' solid-as-a-rock A8N-SLI Premium motherboard (nForce4 chipset) and plugged in 2GB of Corsair DDR400 RAM, a Creative Labs Audigy 2 ZS Platinum soundcard, and a Plextor PX-716SA DVD+/-RW optical drive. Storage duties are ably handled by a 75GB Western Digital Raptor, plus a pair of 250GB WD SATA drives in a RAID 0 configuration.

With that much power locked up in the case, we couldn't wait to see how the FX-57 and GeForce 7800 GTX combo would perform. To no one's surprise, the Nemesis chewed through our benchmarks like Dom DeLuise tearing his way through a Sizzler's all-you-can-eat buffet. The Nemesis netted 100-plus percent improvement over our zero-point system in our *3DMark05* Game 3 test, turning in a mind-blowing 59fps. That's 15 percent faster than the scary-fast 3.73GHz P4-powered Falcon Northwest Mach V (reviewed May 2005), and a whopping 56 percent faster than the 2.6GHz FX-55-powered Polywell Poly 939N4-SLI (reviewed June 2005). Based on these numbers, we decided to subject the Nemesis to the default *3DMark05* test, just for fun: Monarch's system calmly spit back a score of 12,292, which is about 20 percent faster than systems powered by GeForce 6800 Ultra cards in SLI.

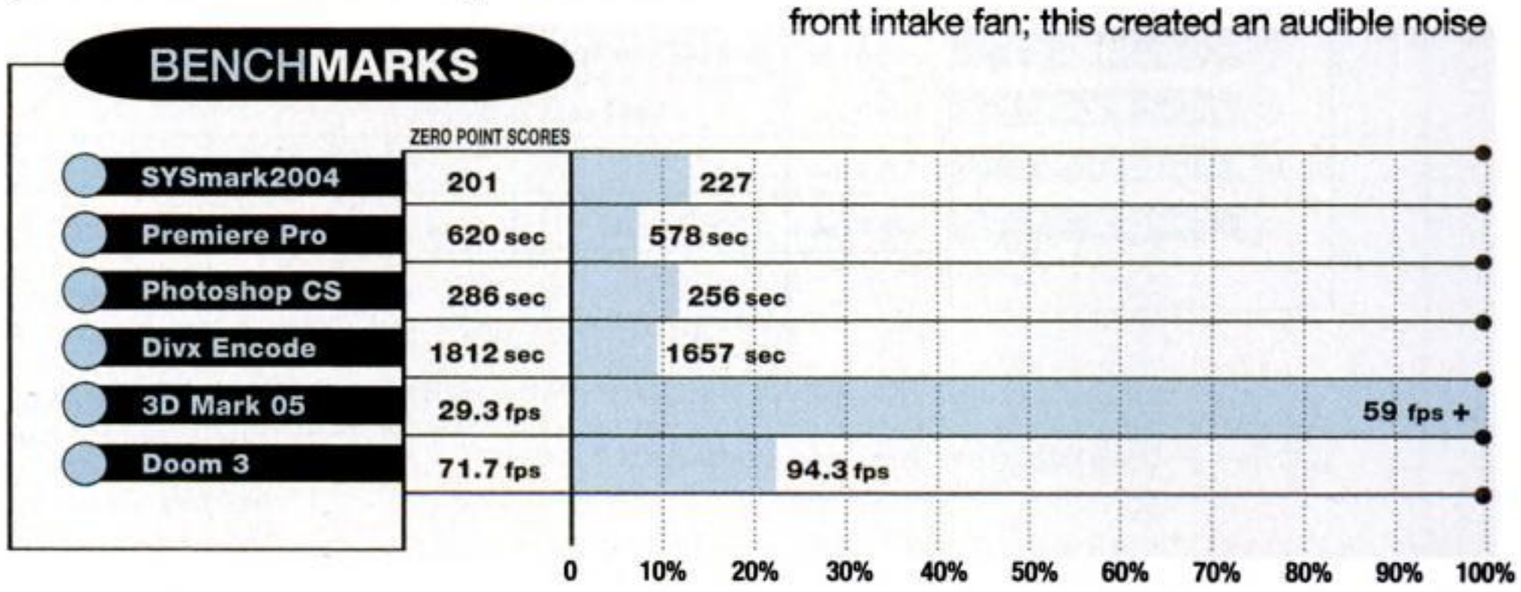
The Nemesis' *Doom* 3 score of 94.3fps was impressive enough that we decided to crank up the detail settings to Ultra—where we saw a drop of just five frames per second. *SYSmark2004* performance was equally great, netting a solid 227. That's not the highest score we've ever seen—that distinction belongs to the Mach V and its brutishly overclocked, liquid-chilled P4—but it does beat all the FX-55 systems we've seen to date. The rest of the benchmark numbers aren't as eye-poppingly impressive when compared with our zero-point scores, but we did see performance boosts consistent with our expectations of what the FX-57 might offer over the FX-55. Besides, gaming performance is where it's at, and Monarch throws in a software bundle consisting of *Half-Life 2*, the 64-bit edition of *Far Cry*, and *Lego Star Wars*, making the Nemesis ready to rock right out of the box.

We tried hard to find something seriously wrong with the Nemesis, and the only thing we could come up with was a loose wire that had somehow come in contact with the fins of the front intake fan; this created an audible noise

UNDER THE HOOD

BRAINS	
CPU	AMD 64 FX-57 (2.8GHz 1MB L2)
MOBO	Asus A8N-SLI Premium (nForce4 SLI chipset)
RAM	2GB Corsair DDR400 (four 512MB sticks)
LAN	Dual Gigabit LAN (nVidia and Marvell), D-Link DWL-AG530 Wireless Card
HARD DRIVE	One 74GB Western Digital WD740GD (10,000rpm SATA), two 250GB WD2500KS (RAID 0)
OPTICAL	Plextor PX-716SA DVD+/-RW
BEAUTY	
VIDEOCARD	Two nVidia GeForce 7800 GTX 256MB cards in SLI (430MHz core, 600MHz GDDR3)
SOUNDCARD	Creative Labs Audigy 2 ZS Platinum
CASE	Custom-painted Thermaltake Shark, with Enermax Noisetaker 600W PSU
BOOT: 73 sec.	**DOWN: 21 sec.**

BENCHMARKS



Our zero-point reference systems uses a 2.6GHz Athlon 64 FX-55, 2GB of DDR400 Crucial Ballistix RAM, two nVidia GeForce 6800 Ultra cards in SLI, a Maxtor 250GB DiamondMax10, a Sound Blaster Audigy 2 ZS, a PC Power and Cooling TurboCool 510 Deluxe Express, and Windows XP Pro with SP2.

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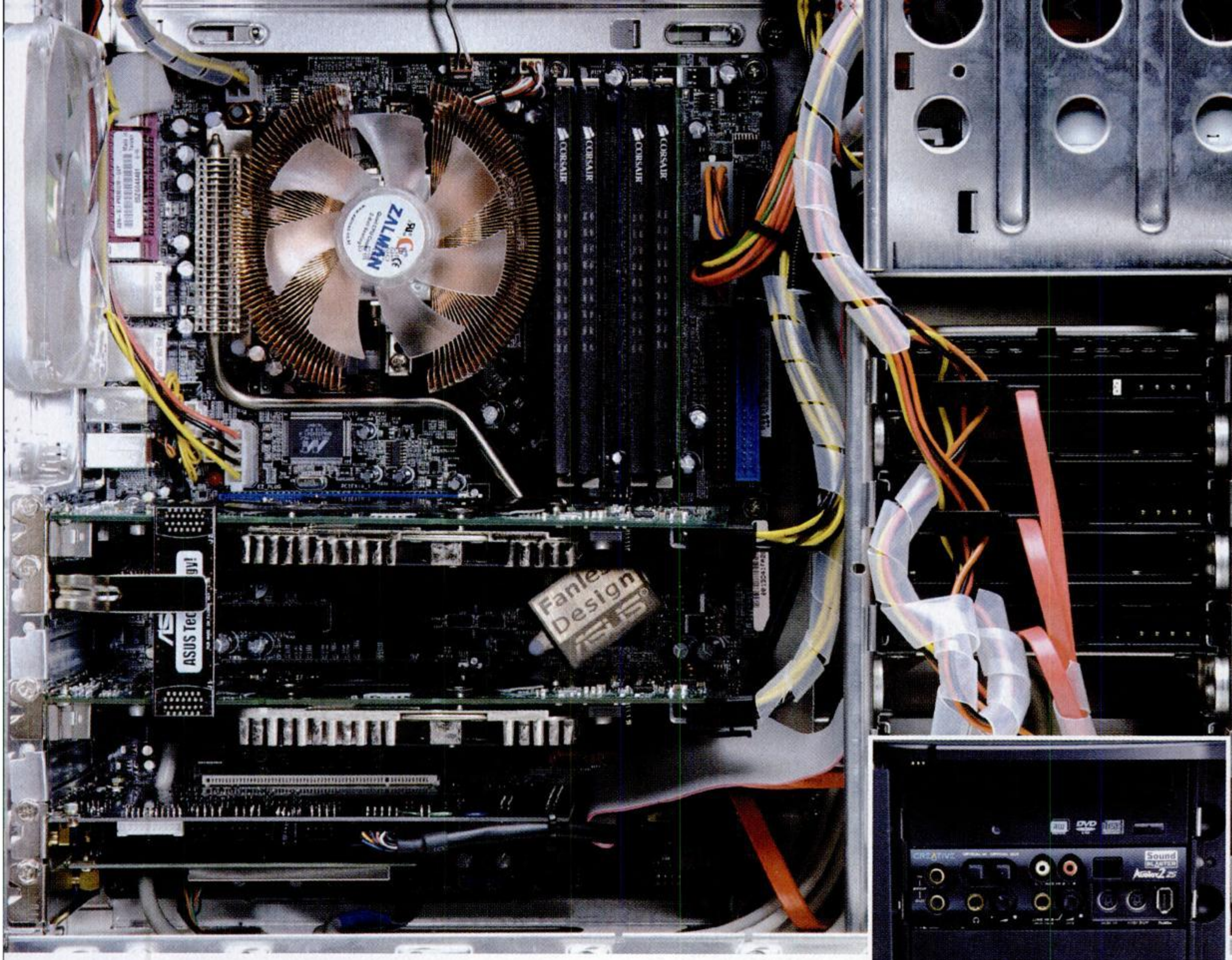
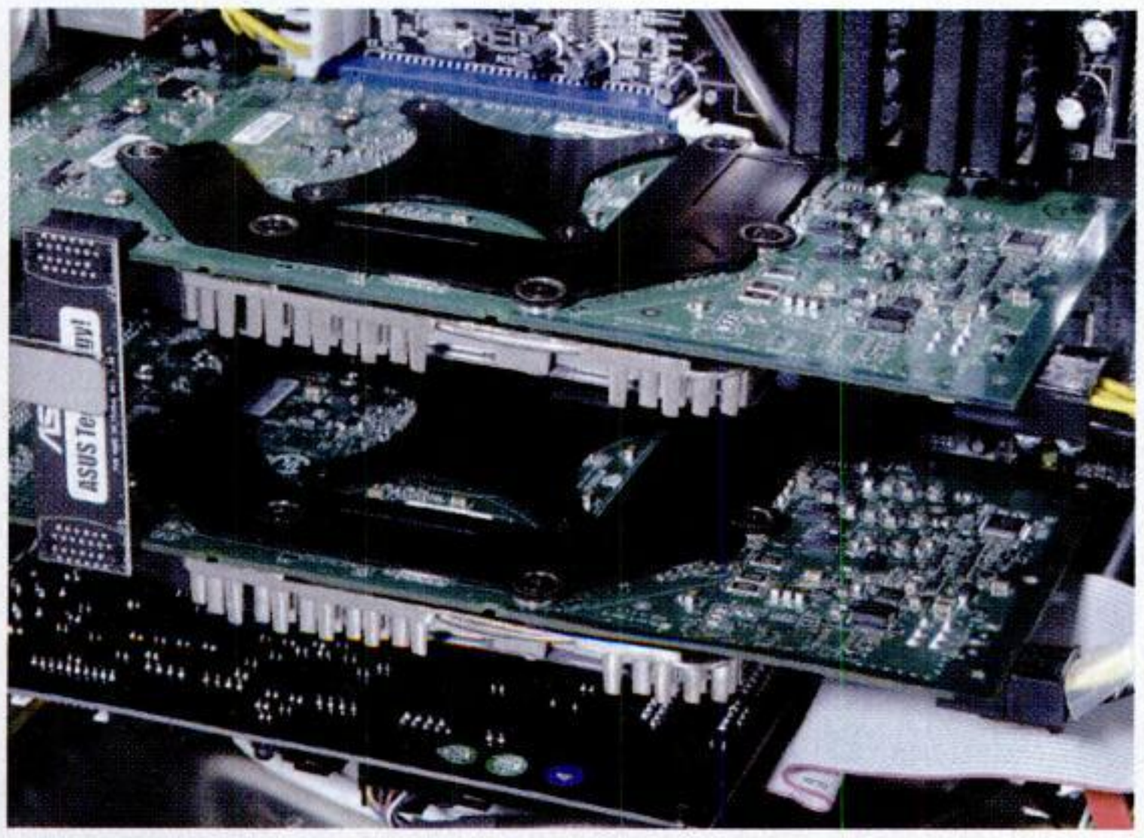


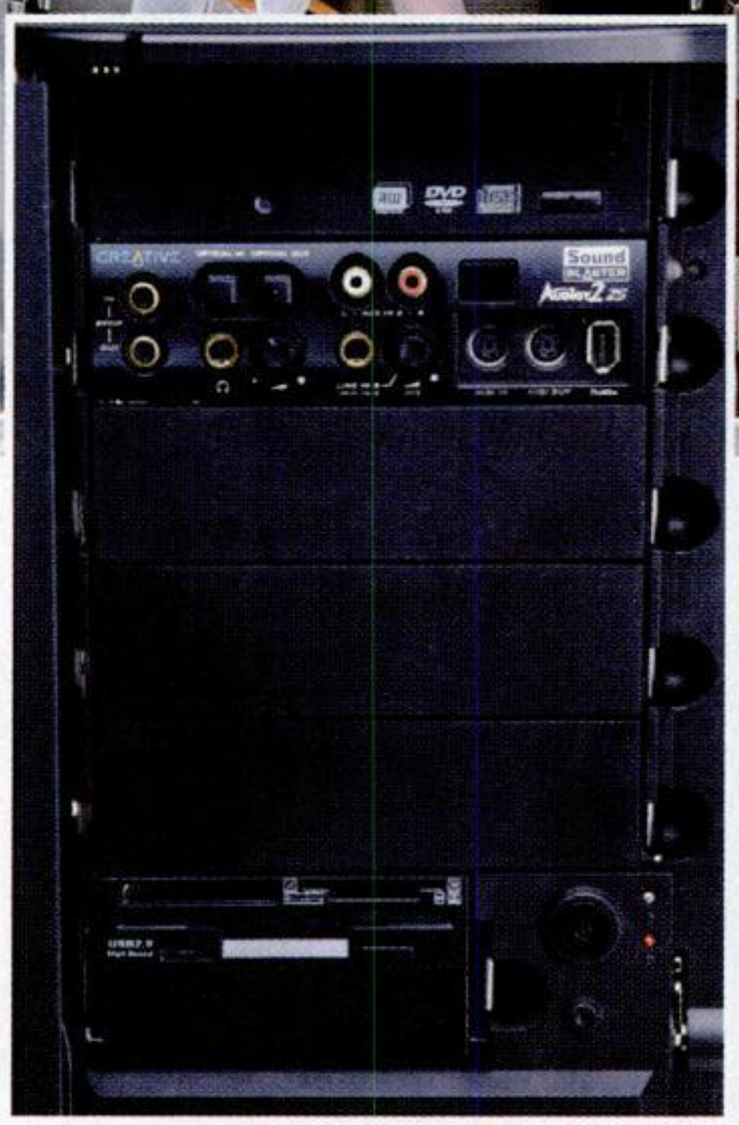
similar to the baseball card we stuck inside the spokes of our childhood Schwinn. It isn't uncommon for things to come loose during shipping, and given Monarch's otherwise-excellent cable-management skills, we're willing to chalk it up to an isolated incident. Besides, we were so busy being impressed by the Nemesis' performance that we hardly even noticed the noise. The Nemesis is proof that single-core machines can still exhibit some superiority over the up-and-coming dual-cores (including our very own Dream Machine). Still, we'd rather have the flexibility and power multi-core offers than the blazing-fast single-core performance you get with the Nemesis.



Two 24-pipe GeForce 7800 GTX cards in SLI mode demolished our benchmarks.

But we've got to give Monarch's PC grudging respect. If we're going to get aced at our own game, losing to a machine as nice as the Nemesis takes some of the sting out of it.

—TAE K. KIM



The Nemesis gives you a media reader and kisses parallel cables goodbye with its SATA DVD burner.

MONARCH NEMESIS

SAMUEL L. JACKSON

An FX-57, two GeForce 7800 GTX videocards in SLI, and Asus' SLI configuration-cardless mobo? You had us at "hello."

MICHAEL JACKSON

Extremely expensive.

9

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$4,325, www.monarchsystems.com

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XFX GeForce 7800 GTX

24 is the new 16, when it comes to pixel pipelines

The XFX GeForce 7800 GTX, powered by nVidia's hot new GPU, delivers blistering performance with high-res games, while running cooler and quieter than the last-gen cards.

It's no contest: If you want the absolute fastest videocard, and money is no object, you want a board—or two—powered by nVidia's GeForce 7800 GTX. That's precisely why we put a pair of reference-design boards in this year's Dream Machine. After examining one of the first retail boards powered by this GPU, we're even more certain of our choice.

XFX managed to push the 7800 beyond nVidia's reference design by clocking this board's graphics core at 450MHz and its memory at 625MHz (compared with the reference design's 430- and 600MHz clocks, respectively). Despite the high clocks, the board remains outfitted with a single-slot cooling solution, thanks to the 7800's smaller, cooler process size (110 nanometers, compared with the 6800's 130nm) and the new chip's improved power management—unused portions of the chip are automatically turned off.

If you just dropped $800 on a 512MB GeForce 6800 Ultra board (or $450 for a 512MB Radeon X800 XL, for that matter) because you thought more graphics memory was going to be the next big thing, we feel your pain. Both nVidia's reference design and this $600 XFX board are outfitted with only 256MB of 256-bit DDR3 memory. It's going to be some time before game developers even begin thinking about tapping into 512MB of graphics memory. The cost of 512MB boards are just too prohibitive for most consumers.

The XFX board has dual DVI ports and a VIVO (video-in/video-out) port on the mounting bracket. The company includes two DVI-to-VGA adapters in the box, plus a breakout cable for analog video (composite, S-Video, and component) for those interested in editing analog video or using a television as a display. XFX even throws a free T-shirt and an XGear force-feedback gamepad into the package.

But let's face it: The 7800 GTX is the real star of this show, and nVidia can claim legitimate bragging rights for designing the most powerful mainstream graphics chip to date. Equipped with 302 million transistors and 24 pixel pipelines (compared with 16 pipes on the 6800 and X850), this card chewed through our benchmarks like a beaver through birch.

With resolutions cranked up to 1600x1200 and with 4x antialiasing enabled, a single 7800 GTX delivered performance increases ranging from 30 to 63 percent over a single GeForce 6800 Ultra. *Doom 3's* benchmark performance increased the least, moving from 43.5fps on the 6800 Ultra to 56.7fps on the 7800 GTX. The biggest increase occurred with *3DMark03's* Game 4, which jumped from 33.6fps to 54.9fps. Refer to the benchmark chart for the full scoop.

Running two 7800 GTXs in SLI yielded even more impressive results, including a 122 percent frame-rate increase in *Far Cry* when compared with a 6800 Ultra (137.7fps, compared with 62fps). On some games, however, running two of these cards in SLI moves the performance bottleneck from the GPU to the CPU. When we throttled our test platform's CPU back from 2.6GHZ to 1.8GHz, *Doom 3* performance on a single 7800 GTX decreased only one frame per second. When we performed this same test in SLI, frame rates dropped from 86.3fps to 71.4fps, indicating that the dual GPUs were left tapping their feet as they waited for the CPU to catch up.

Our test bed is outfitted with an Athlon FX-55 processor. If you're running a slower processor, it might make more sense to upgrade your CPU before you buy more than one 7800 GTX. The flipside of the equation, of course, is that a single 7800 GTX will deliver a considerable performance boost even if you are running a slower CPU. The downside of the equation is the price tag: A single XFX GeForce 7800 GTX costs $600; double that for an SLI configuration. Is it worth it? Well, let's put it this way: We didn't let the high price stop us from rating it Kick Ass.

—MICHAEL BROWN

SPECS

GRAPHICS PROCESSOR	nVidia GeForce 7800 GTX
GRAPHICS CORE CLOCK SPEED	450MHz
PIXEL PIPELINES	24
ONBOARD MEMORY	256MB DDR3
MEMORY CLOCK SPEED	625MHz
MEMORY INTERFACE	256-bit

BENCHMARKS

	6800 ULTRA	7800 GTX	7800 GTX SLI
3DMARK 05	5,536	8,054	11,564
3DMARK 03	12,949	16,898	27,958
3DMARK 2005 GAME 2 (FPS)	26.6	37.0	73.3
3DMARK 2005 GAME 4 (FPS)	33.6	54.9	104.6
HALO 1.06 (FPS)	71.1	107.9	136.0
DOOM 3 DEMO 1 (FPS)	43.5	56.7	86.3
FAR CRY 1.31 (FPS)	62.0	84.3	137.7

All benchmarks are run on our Athlon FX-55 test system, which includes an nForce4 SLI motherboard and 2GB of DDR SDRAM. Halo 1.06 tested at 1600x1200 with sound disabled. Doom 3 tested at High Quality, 1600x1200, 4x AA. Far Cry 1.31 and 3DMark03 Game 2 and Game4 tested at 1600x1200, 4x AA, and 8x aniso. 3DMark03 Game2 and Game4 tested at 1600x1200, 4x AA, and 8x aniso. 3DMark03 and 3DMark03 are run using default settings.

XFX GEFORCE 7800 GTX

HEADSHOT

Enables you to crank up the resolution in the most demanding games.

GUTSHOT

Pricey; CPU becomes a bottleneck in SLI mode.

10

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$600, www.xfxforce.com

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Tt Thermaltake

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Widescreen Wonders

Who says there are no good deals to be had in real estate?

Back in December 2004 we reviewed two 23-inch widescreen LCDs that at the time seemed like the height of decadence for a desktop monitor. And they were. While the appeal of having so much screen space was palpable, the $2,000-plus price tags were enough to give one pause.

But here we are less than a year later, and screen sizes have not only grown to a whopping 24-inches, but their costs have plummeted (shoot, one of the LCDs reviewed here costs the same as a standard 19-inch monitor).

This certainly merits a closer look.

—KATHERINE STEVENSON

SAMSUNG 243T

Once you're done ogling the sheer size of the 243T's screen, you'll notice it sits atop a telescoping/pivoting neck and is framed by a simple bezel (available in either black or silver) that's unadorned save a row of buttons on its bottom edge that control the onscreen display. Unfortunately, when the LCD is connected via DVI, OSD adjustments are strictly limited to the brightness settings.

This nonetheless came in handy when we fired up *DisplayMate* (**www.displaymate.com**) to evaluate the screen's qualities. We found that with the brightness tuned to about 50 percent, the screen was capable of producing a deep black level while still keeping the darkest shades of gray intact. The 243T was equally strong on the other end, reproducing the very lightest grays against white. What's more, the screen excelled at everything in between, reproducing gray-scales of up to 256 steps with aplomb. Transitions in shades appeared fluid and flawless.

Go ahead, spread out. Samsung's 243T offers room to spare in every direction.

In real-world use, the 243T's picture looks stunning. Watching DVDs full-screen on a monitor this size is impressive, to be sure, but you'll want to keep a safe distance lest you become distracted with your source material's every quality flaw (it makes a mighty compelling case for HD video!). As for gaming, you'll likely find that either your system or the given game won't support the LCD's 1920x1200 native resolution, but that needn't be a deal breaker. We ran *Need for Speed Underground 2* at 1024x768 (the highest resolution the game would play on this monitor), with a 4:3 aspect ratio interpolated to fill the screen. Still, we found the experience gratifying. With our field of vision filled from side to side, we felt totally immersed in the high-speed action and saw nary a smear nor ghosted image.

SAMSUNG 243T

+ LARGE SCREEN

Flawless performance and oodles of screen real estate.

− INFLAMED SPLEEN

Dell's LCD gives us comparable performance and more OSD adjustments at a much lower price.

9

$1,600, www.samsung.com

DELL ULTRASHARP 2405FPW

It's as though someone took a rolling pin to our beloved Dell 2001FP 20-inch LCD and extended its proportions. The 2405FPW sports similar styling to its 4:3 kin, the same wide range of ergonomic adjustability, and a bounty of extras, including four USB 2.0 ports and a built-in 9-in-1 media reader.

OSD controls are up front and intuitive, and while some options are disabled with the digital interface, color temperature presets and RGB sliders are fully functional. We like that.

Our infatuation was somewhat tempered when evaluating the 2405FPW's black level. LCDs are inherently challenged in this respect because of their ever-present backlight, but even with the brightness turned all the way down, the 2405FPW's black wasn't quite as dark or deep as the 243T's. Fortunately, the drop in brightness didn't diminish the distinction between black and dark grays.

In fact, the 2405FPW performed quite well in all of *DisplayMate's* gray-scale scripts, nearly matching the 243T's superb performance. The 2405FPW's only shortcoming was in the 256-step scales, where subtle signs of compression and expansion were evident at various steps. But unless you're doing exacting color matching, you probably won't notice this in real-world use—we certainly didn't when viewing digital images, DVDs, and games. All of the above looked gorgeous on the 2405FPW's ultra-expansive screen.

Indeed, despite the 2405FPW's minor foibles, we're declaring it the winner in this contest. The 2405FPW might not have as strong a black level or as exact a gray-scale as Samsung's 243T, but it tops the latter with more image-adjustment options, a slew of inputs, and a picture-in-picture feature—all at an unbelievable price.

DELL ULTRASHARP 2405FPW

+ CINEMATIC

A big, beautiful screen, extra features, and a killer price make this one hell of a fine widescreen.

− PANCREATIC

Black level lacks depth.

9

MAXIMUM PC KICKASS

$960, www.dell.com

For the amount of screen and other goodies Dell's 2405FPW offers, its low price seems almost criminal.

SPECS

	SAMSUNG 243T	DELL 2405FPW
SCREEN SIZE	23 inches	23 inches
NATIVE RESOLUTION	1920x1200	1920x1200
ASPECT RATIO	16:10	16:10
INPUTS	DVI, VGA	DVI, VGA, S-Video, Composite, Component, 4 USB 2.0

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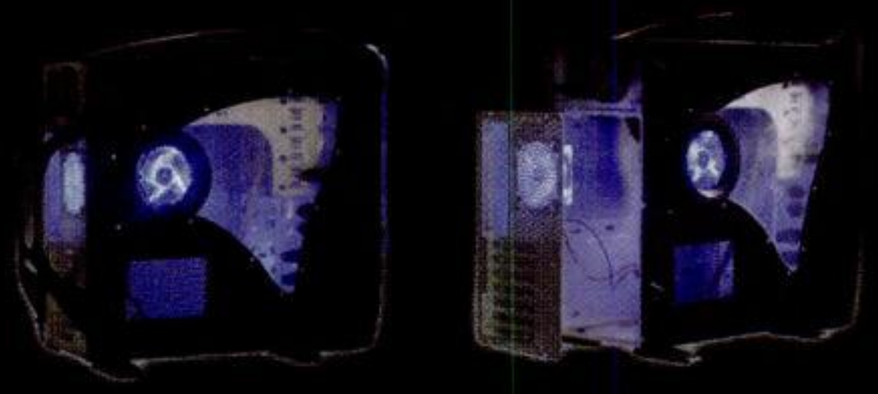

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Nifty 250s!

Two hard drives are born again thanks to SATA 3G

Now that SATA 3G is all the rage, both Hitachi and Western Digital have relaunched their 250GB, 7,200rpm desktop drives with the new 3G interface. Western Digital also doubled its drive's buffer size, and Hitachi has significantly increased its drive's platter density. Which upgrade delivers the biggest performance increase? Read on to find out!

—JOSH NOREM

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APR-2005
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Hitachi's T7K250 uses only two 125GB platters.

WESTERN DIGITAL WD2500KS

We reviewed Western Digital's 250GB Caviar SE drive in January 2004. Eighteen months later, WD has taken this same drive, added a SATA 3G interface and another 8MB of cache (for a total of 16MB), and relaunched it as its new top-of-the-line desktop entry.

Western Digital has upgraded its Caviar 250's cache to 16MB.

Comparing the old and new Western Digital drives, we found that the 8MB model delivered average read speeds of around 47MB/s, while the new drive rung up 53MB/s—a significant improvement. The new drive's *H2benchw* application index score also jumped, from 19.7 to 25.1—a titanic increase. The SE 16 is very quiet, too; and it never got more than warm to the touch, even under load.

Although the WD2500KS holds its own, the drive remains a tick slower than Hitachi's new offering; it's also just a bit slower than some other 7,200rpm drives we've tested recently. Its application-index score of 25.1, for example, is damn good—but it doesn't break any records. You should also be aware that the WD2500KS does not support native command queuing (NCQ), despite its SATA 3G interface. But we don't mind this shortcoming at all, because NCQ doesn't deliver significant gains in a single-user environment.

WESTERN DIGITAL WD2500KS

BITS
Big buffer, quiet and cool, and a decent capacity.

SCRATCHES
Doesn't break any performance records.

9

$190, www.wdc.com

HITACHI DESKTAR T7K250

Like Western Digital, Hitachi has taken last year's 7K250 drive, added a SATA 3G interface, and renamed the new model the T7K250. Unlike WD, however, Hitachi decided to stick with an 8MB buffer. The company also went from using three 83GB platters to two 125GB platters. This increased platter density seems to make up for the T7K250's relatively small buffer.

If this Hitachi drive had a 16MB buffer—as the company's 7K500 drive does—it would most likely be significantly faster. As it stands, it's still one of the fastest 7,200rpm drives we've ever tested.

The T7K250's application index score of 25.5 is very good, although it's not as good as the Maxtor DiamondMax 10's score of 26.6 or the Western Digital Raptor's score of 26.4. But its average sequential read speed of 55.9MB/s is the highest we've seen from a 7,200rpm drive, which is impressive. Compared with the WD drive, the scores are fairly close across the board, but the Hitachi pulls out wins in almost every category. It's extremely quiet and it never got too hot during testing. It also comes with the ultra-handy Feature Tool utility that lets you ratchet down seek speeds to improve acoustics, change SATA settings, and perform other nifty tweaks.

The T7K250 isn't fast enough to completely dethrone the Maxtor DiamondMax 10 as king of the mid-size 7,200rpm drives, but it comes damn close, and that makes it a very worthy alternative. In fact, the T7K250's record-tying—and in some cases, record-breaking—performance earns it a Kick Ass award. What's more, the T7K250 does support NCQ, and you can see the results in our *IOmeter* multi-user-enviornment benchmark: The Hitachi drive eats the Caviar's lunch. As we've pointed out before, the benefits of NCQ support aren't all that apparent in single-user applications, but we predict this protocol will become more important down the road as dual-core CPUs and multi-threaded applications become more prevalent.

HITACHI DESKSTAR T7K250

BATMAN
Very fast, quiet, cool, and affordable.

SCATMAN
Damn good, but not earth-shattering; 8MB buffer.

9

MAXIMUM PC KICKASS

$185, www.hitachigst.com

BENCHMARKS

	WD2500KS	T7K250
HD TACH 3 RANDOM ACCESS TIME (MS)	13.3	**13.1**
HD TACH 3 BURST RATE (MB/S)	**173**	133
HD TACH 3 AVG. SEQUENTIAL READ (MB/S)	53	**55.9**
H2BENCHW APPLICATION INDEX*	25.1	**25.5**
DOOM 3 LOADING (SEC)	34	**32**
5GB READ (SEC)	105	**100**
IOMETER 50% RANDOM WORKLOAD (IO/SEC)	235	**293**
OPERATING TEMP WITH NO FAN**	**40**	41

*Best scores are bolded. *The application index is a real-world script of six applications. The score is based on the time it takes the drive to complete the scripts. **Hard drive temperatures measured using S.M.A.R.T. data, as reported by the Speedfan utility.*

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Cambridge SoundWorks PlayDock MP3

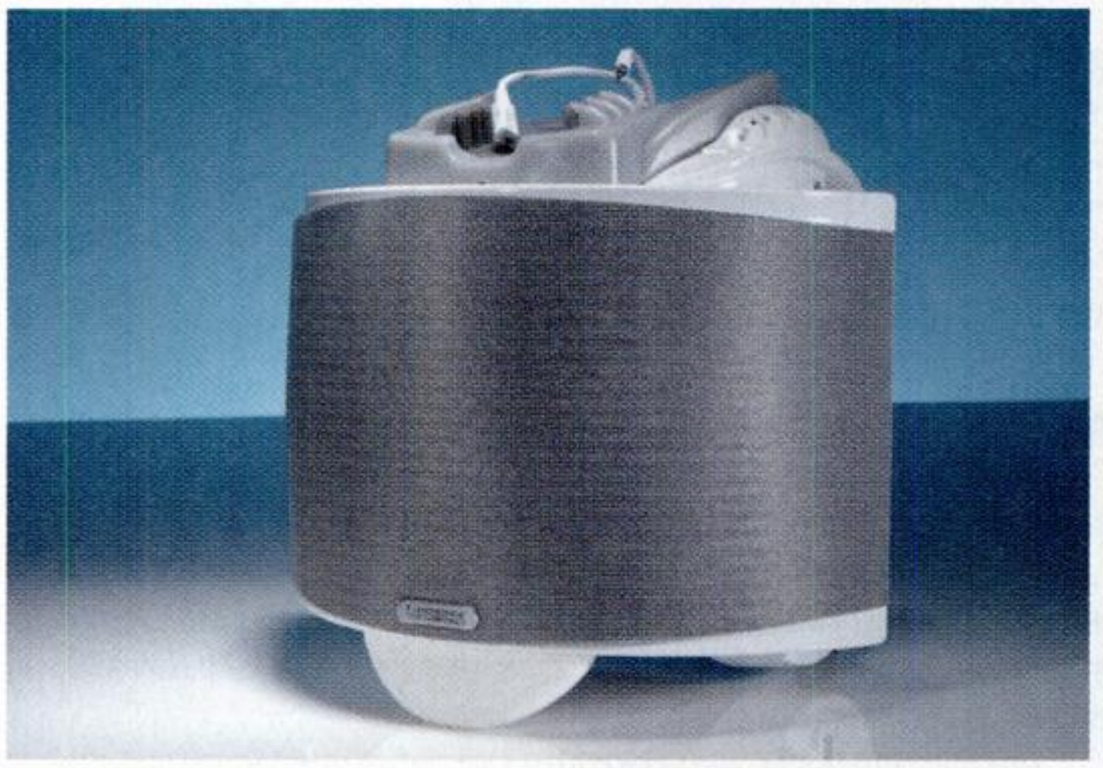
Finally, someone gets MP3-player speakers right

MP3 players are all about taking your music everywhere you go, but headphones don't cut it when you want to rock out with a crowd. And while many companies offer MP3-player speakers, Cambridge SoundWorks' PlayDock MP3 Audio System is the best go-anywhere MP3 speaker system we've tested.

The PlayDock can host several brands of MP3 players (including Apple's iPod and iPod Mini, Dell's Pocket DJ, and most of Creative Labs' Zen models), depending on which neoprene "glove" you attach to its top. One stub cable provides power to the MP3 player, and another plugs into the player's headphone jack (the iPods use only the headphone jack). While AC-powered, the device will charge Creative and Dell players (but not the iPods).

Aside from its terrific sound, the feature that sets this speaker system apart from the pack is its portability; scratch that, "luggability" is more accurate. The PlayDock sans MP3 player tips the scales at 13.5 pounds, thanks to the presence of the humongous rechargeable 12-volt battery in its base. You can leave the unit plugged in when you're at home, and then unplug it when you're ready to hit the road. The battery delivers about eight hours of play time at moderate volume, and it can be recharged from any partially charged state without worries of overcharging or developing "memory" issues. A large handle integrated into the top makes the unit easy to carry, and huge rubber feet on the bottom give it a firm grip on most any surface.

Most importantly, the PlayDock is a joy to listen to. Two separate amps deliver 7 watts each to 2.25-inch fiber/resin cone drivers, while a third amp delivers 15 watts to a center-mounted, 3.25-inch, polymer subwoofer. All three speakers are magnetically shielded. Listening to an MP3 version of Robert Earl Keen's "Long Chain" (ripped at 320kb/s constant bit rate), we were impressed with the system's dynamic range: The PlayDock delivered the song's dirge-like bass and heart-rending mandolin without blunting its twangy vocal harmonies.



An MP3 player paired with Cambridge SoundWorks' PlayDock MP3 makes a fabulous portable audio system.

The PlayDock MP3 is a fabulous audio solution for music lovers on the go.

—MICHAEL BROWN

CAMBRIDGE PLAYDOCK 9

$200, www.cambridgesoundworks.com

demonic possession

de•mon•ic (dĭ-mŏn′ĭk)
adj. pos•ses•sion (pə-zĕsh′ən)

BEING COMPLETELY CONTROLLED BY ***passion*** OR THE SUPERNATURAL

A ***mania*** RESTRICTED TO ONE THING OR IDEA AT THE EXCLUSION OF ALL ELSE

MOTIVATED BY A ***spiritual*** FORCE OR GENIUS; INSPIRED

THE STATE OF A HUMAN BODY UNDER DEMONIC ***influence***, WITH THE INTENTION OF USING IT FOR ***punishment*** OR A TEST.

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AKG K 28 Noise Reducing Headphones

Svelte phones deliver pain with pleasure

AKG's noise-reducing headphones sound good and do a fine job of reducing ambient noise, but they clamp your ears like a set of vice-grips.

AKG manufactures some fabulous headphones, but we're disappointed with the company's noise-reducing model K 28 NC. The phones sound great and do a fine job reducing ambient noise, but they're damnably uncomfortable to wear.

Headphones can help you retreat into your own private acoustic world; and with the acoustics of the outside world getting louder and more intrusive with each passing day, headphone designers have come up with technology designed to combat it: noise-canceling circuitry.

Tiny microphones on each closed-back earphone monitor ambient noise and send the low-frequency signals they pick up to a small module you can clip on your belt. Turn on the module and it reverses the polarity of these signals to generate a mirror-image signal, which it then pipes back to the headphones to cancel the waveform of the ambient noise.

In our tests, AKG's noise-reduction circuitry was effective at reducing—but not eliminating—everything from vehicle road noise to the aggravating whine of our PC's cooling fans. And to be fair, AKG doesn't claims these headphones will altogether cancel ambient noise. We were nonetheless disappointed to discover that the noise-reducing circuitry generated a little noise of its own even when no ambient noise was present. Fortunately, this noise had no discernible impact on music, dialog, or sound effects from the CDs, movies, and games we tested the headphones with.

When folded, the headphones fit into a 6x4-inch nylon bag (included). But their compact size carries an annoying trade-off: Because there's no way to adjust the size of the headband before its on, you're forced to drag the earphones down to your ears with two or three tugs while tiny rubber pads on the headband threaten to pull your hair out by the roots. Take the phones off and they retract to their original size, which means the hair-pulling is not a one-time event. With the phones in place, the earmuffs hugged our ears so tightly that we felt like Uncle Fester wearing his infamous vise-clamp hat.

We'd really enjoy traveling with and listening to these headphones—if we could only stand wearing them.

—MICHAEL BROWN

AKG K28 HEADPHONES **6**

$160, www.akg.com

Oakley Thump MP3 Player Sunglasses

There's a lot more to it than offends the eye

If you don't mind looking like Bono after Borg assimilation, Oakley's Thump MP3 player sunglasses sound as good as the company's other sunglasses feel.

To hell with the schmucks at the office who pointed fingers and doubled over with laughter as we walked around the building—Oakley's Thump might look abominable, but the sound quality and build far surpassed our expectations, and this most unlikely of convergence devices comes in handy like no other MP3 player can.

The Thump is much lighter and more comfortable to wear than it looks. The glasses go on and come off effortlessly, thanks to adjustable earbuds that face your ear canals instead of resting inside them. Although this design choice means you don't get the same brawny bass punch that traditional earbuds deliver, bass notes were nonetheless clear and distinct, with lower frequencies sitting beautifully in the mix beneath crisp highs. Even the delicate reverb on one of our test tracks was reproduced with the same clarity as an iPod paired with Shure's swank Ec3 earbuds.

This open-air design provides an important advantage: You can enjoy music and still hear warning shouts on the slopes ("Tree! Tree! Look out!"). The MP3 player's control buttons are equally well designed: You'll find them placed on the tops of the frame arms, with just enough space between them to be easily manipulated by even gloved fingers.

SPECS

PLAYS	MP3, WMA (including protected WMA), WAV
CAPACITY	512MB
BATTERY LIFE	Approximately 6 hours

The Thump connects via a USB 2.0 miniport, loads up through Windows Explorer (yes, you can transfer data files as well), and 512MB is just enough capacity for a day at the park. The lenses are absolutely free of distortion even at the extreme corners, and they flip up for quick peeks at another skier's butt. The Thump doesn't support a continuous repeat mode, so it was difficult to get an exact read on battery life, but our informal gauge jibes with Oakley's six-hour rating.

Whether you're snowboarding or playing bocce with the crusty Italians in San Francisco's North Beach, the Oakley Thump is a smart, unique gizmo unlike any other MP3 player we've tested. Still, it falls far short of its $495 price tag. At that ridiculous price, we'd just as soon take our chances with an iPod Mini and a fat life-insurance policy.

—LOGAN DECKER

OAKLEY THUMP MP3 **7**

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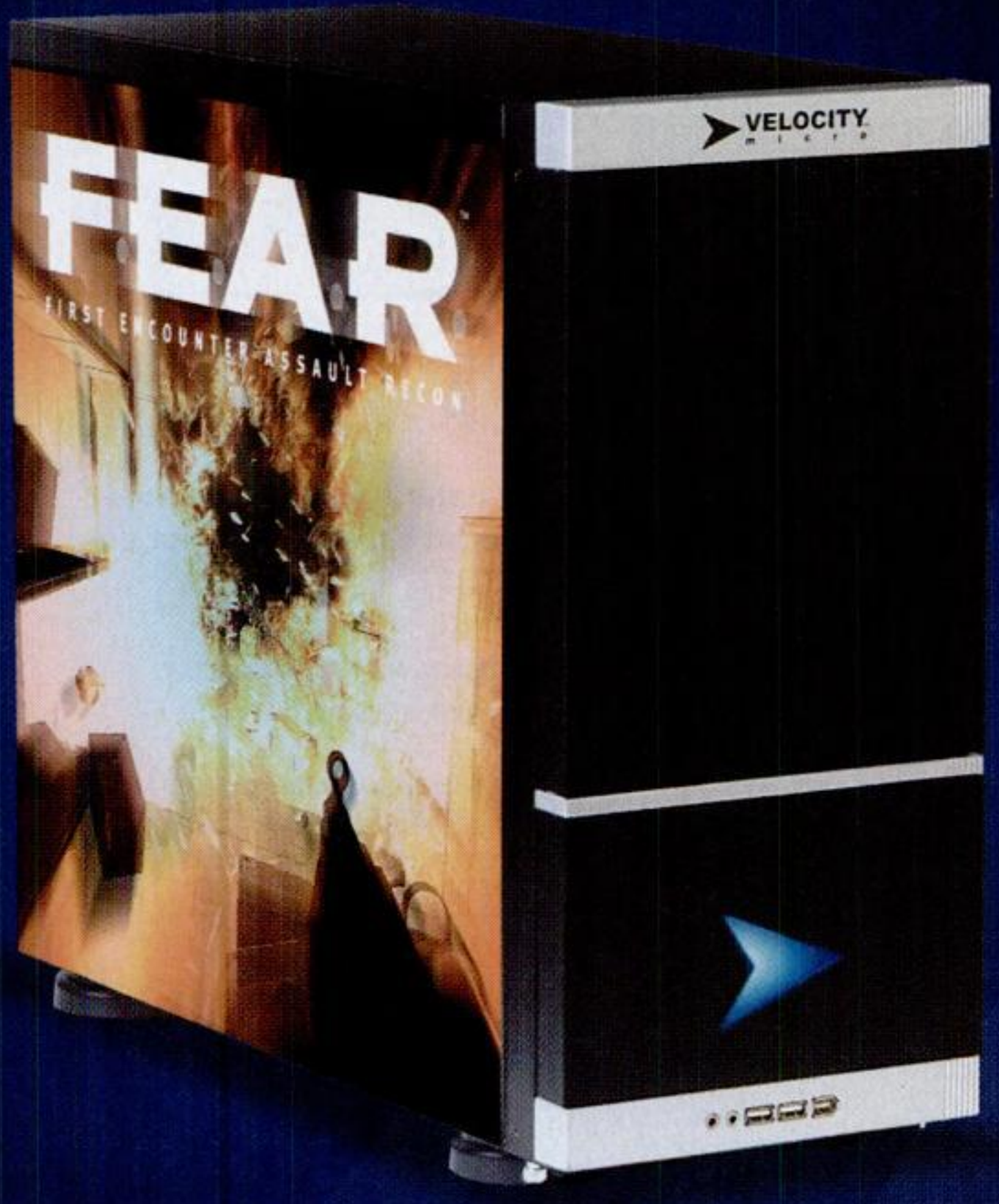

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ACDSee PowerPack 7

A triumphant saga of loss and redemption

A *CDSee 6* wasn't just bad—it was *vindictive*; it was a clunky monstrosity that buried unstable features beneath an interface resembling something you might find on a 1950s' Russian submersible. But it seems that ACD Systems pulled a Silkwood on those responsible, because *ACDSee PowerPack 7* is a dazzling, elegant return to form and functionality.

On launch, *ACDSee 7* offers to catalog and thumbnail the images on any combination of folders, subdirectories, and drives, all without insisting that they be moved to conform to its own directory structure—it leaves the files just where they are. When it's finished cataloguing, it defaults to a simple, three-paned view: A Windows Explorer-style view appears in the top-left pane, a folder and thumbnail view appears in the right-hand pane, and a preview pane takes up the bottom-left. Each window is resizable, moveable, and configurable.

From here, every conceivable image-browsing task is a mere one or two mouse clicks away (thanks in part to a context-sensitive toolbar that monitors what you're doing and then presents the most logical set of tools for that task). Our favorite feature is the Image Basket, a dumping ground where you can resize, rotate, convert, copy, move, or even email images. The effortless nature with which every image-management task can be accomplished is unparalleled.

ACDSee 7 falls short of a perfect 10 only because we feel its launch speed can be improved, and because we think the developer should have bundled its underrated *PicaView* application with the product. *PicaView* lets you instantly preview multimedia files with a simple right-click. Aside from that, *ACDSee 7* renders image browsing, manipulation, editing, and sorting so easy—and so fast—that you'll wonder how on earth the company will improve upon it. Skeptical? Download the trial version and see if you don't agree.

Easy enough for newbs, yet capable of catering to professional photographers: *ACDSee PowerPack 7* is an essential tool for image browsing and manipulation.

—LOGAN DECKER

ACDSEE POWERPACK 7 — 9

$80, www.acdsystems.com

MAXIMUM PC KICKASS

Firegraphic 8

Latest version of promising image editor remains… promising

If you've got Mac envy, you'll dig *Firegraphic 8's* sleek, handsome appearance. Dig those gradients! Savor those dusky grays! And then you'll go back to using a more stable image-browsing and editing application, such as *ACDSee 7.*

Having said that, Firegraphic 8 remains a huge leap forward from version 7, which had all the speed and reflexes of a heavily medicated mental patient. *Firegraphic 8* is much more graceful and agile than its predecessor; it's quick to launch, render thumbnails, and preview photographs. And it matches a majority of the features available in the more expensive *ACDSee PowerPack 7. Firegraphic 8's* folder preview is particularly useful and unique: Hover your mouse over a folder and you'll get a preview of its contents in four pop-up thumbnails—nice.

But few of *Firegraphic 8's* other features are so well implemented. Its Thumbnail Tray is analogous to the one in *ACDSee PowerPack 7,* but working from it is hardly intuitive: You're offered only rudimentary file-management tasks by right-clicking—the rest you have to access through the application menus, which is an unnecessary hassle. It's not as easy, for example, to assemble a handful of images—say, "Lake Tahoe Trip" or "Human Rights Abuses"—and resize them for emailing to a friend, as it is in *ACDSee PowerPack 7.*

Freaky behavior abounds in *Firegraphic 8.* Graphics glitches are frequent, repeating the same image over and over. And submenus didn't automatically expand when we clicked a menu and then dragged our mouse down the list of choices—a standard Windows convention; instead, we had to intentionally click any menu item to force its submenu to appear.

Entomophobia is the fear of bugs. If you're an entomophobe, you may want to steer clear of *Firegraphic 8,* despite its generous features.

Don't get us wrong, *Firegraphic 8* isn't a bad application; in fact, it's quite sophisticated and is often faster than *ACDSee 7* when it comes to creating thumbnails from large photo collections. But it's simply not stable enough to recommend, especially when compared with ACD System's equitably priced *ACDSee 7.* It suffers still further in comparison to the slightly more expensive *ACDSee PowerPack 7,* reviewed above.

—LOGAN DECKER

FIREGRAPHIC 8 — 6

$50, www.firegraphic.com

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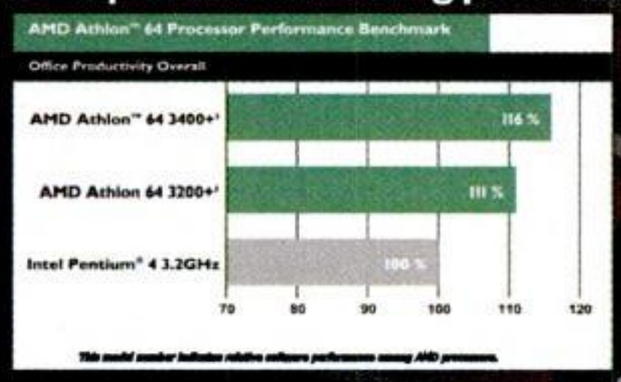

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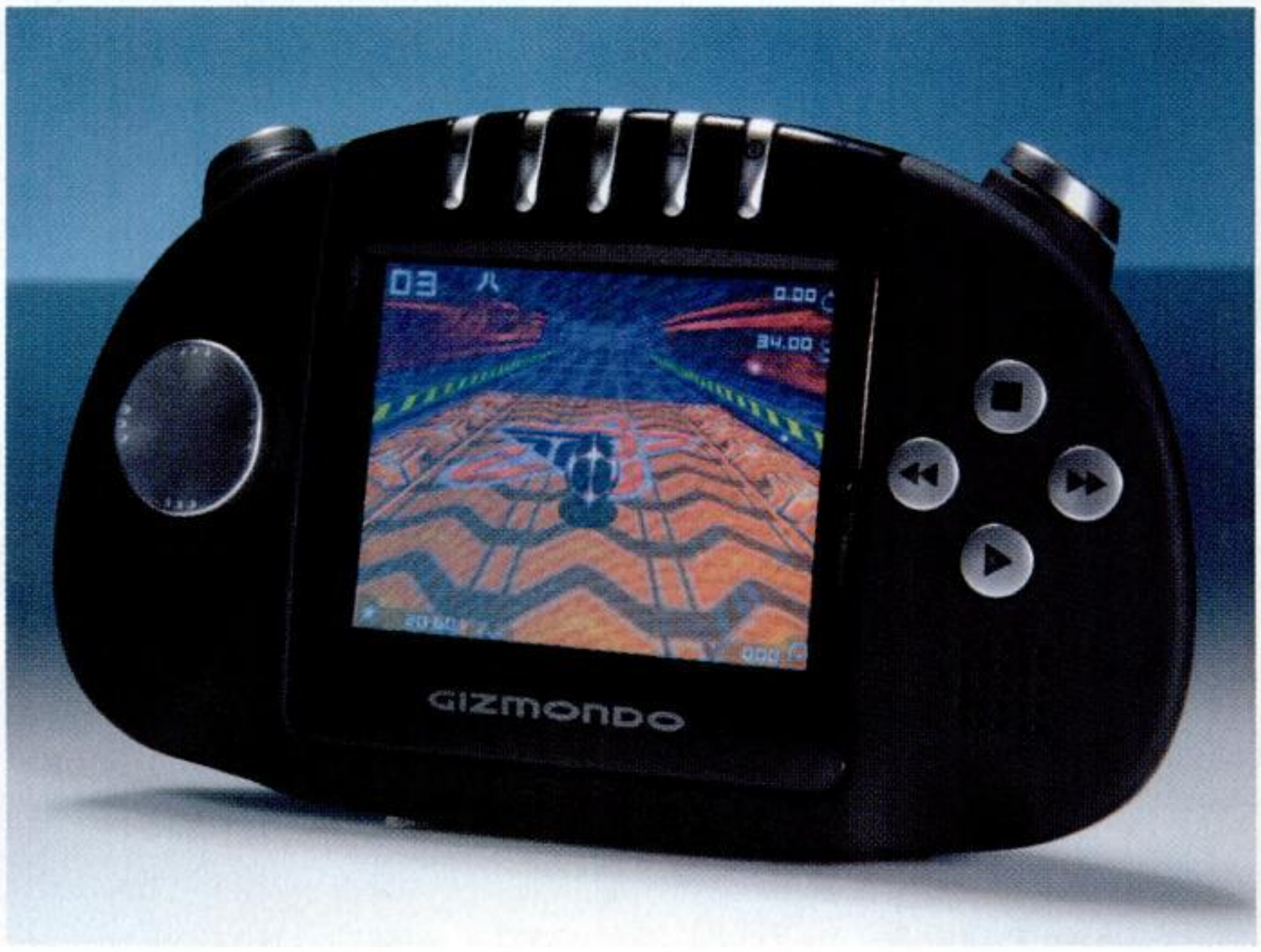

Using the Gizmondo is akin to watching a magician pull a rabbit out of his hat—only the rabbit's dead and missing some limbs.

Gizmondo

Handheld gaming system is mondo abysmal

We'll get right to the point: The Gizmondo handheld gaming system is not worth your gaming dollar. Although it boasts a staggering complement of built-in features—including a built-in digital camera, Bluetooth, GPS, and support for SMS messaging—the Gizmondo lacks one key feature: fun.

The pain begins with five "piano" keys at the top. These require a great deal of pressure to push, but their action is so slight that it's tough to tell when you've pressed one. This just aggravates the problem of a device that's slug-slow to respond—even powering up takes almost a full minute. The Gizmondo claims it can play MPEG-4 video and MP3s from an SD card, but it didn't play most of our test MPEG-4 videos; and if you dare to look up someone's telephone number while listening to music, playback stutters.

The Gizmondo has a built-in GPS unit, so you can keep track of your kid via the web (if actually watching him or her is too much of a bother). Kids also have the option of pressing an emergency button to send an SMS message to your cellphone, informing you of their location—as long as the Gizmondo is powered on, can obtain a GPS satellite signal (we couldn't), and the battery doesn't poop out (as it will do in less than two and a half hours).

The Gizmondo does have one thing going for it: It's very comfortable to hold while playing games. And you can shave $100 off the device if you consent to wirelessly receive up to three ads a day, which appear on the device when you launch games. But the number of titles available at press time barely earns the plural (we review three here). The Gizmondo makes Nokia's N-Gage seem desirable, and the downfall of the vastly superior but discontinued Zodiac Tapwave does not bode well for this clumsy stab at portable entertainment.

—LOGAN DECKER

GIZMONDO

+ BITE-SIZED
Very comfortable to hold, decent gaming buttons, GPS navigation.

− DOWNSIZED
Slow, aggravating, buggy; some features require subscription service. No analog stick.

3

$400, www.gizmondo.com

GIZMONDO GAMES

RICHARD BURNS RALLY Less a racing simulation than a demonstration of the horrors of drunken driving, *Richard Burns Rally* will have you constantly veering off track, pirouetting on two wheels, and spinning out at the slightest provocation. Add bland tracks to the floaty physics, and you just might fall asleep at the virtual wheel. **—LD**

RICHARD BURNS RALLY **3**

www.gizmondo.com*

TRAILBLAZER The Gizmondo's simplest game—you're a wheel tumbling forward on a straight track—is also one the most consistently entertaining. Accelerating at a breathtaking pace, you'll roll over power-ups while dodging gaps in the lane, all beneath the hallucinatory glow of those pretty lights. **—LD**

TRAILBLAZER **7**

www.gizmondo.com*

TOY GOLF *Toy Golf* transforms common slob symptoms—such as a cluttered garage, a disorganized computer room, and a neglected attic—into wacky golf courses. Hazards take the form of table edges, kitchen sinkholes, and the like. There are only 10 environments, but it sure beats cleaning up. **—LD**

TOY GOLF **5**

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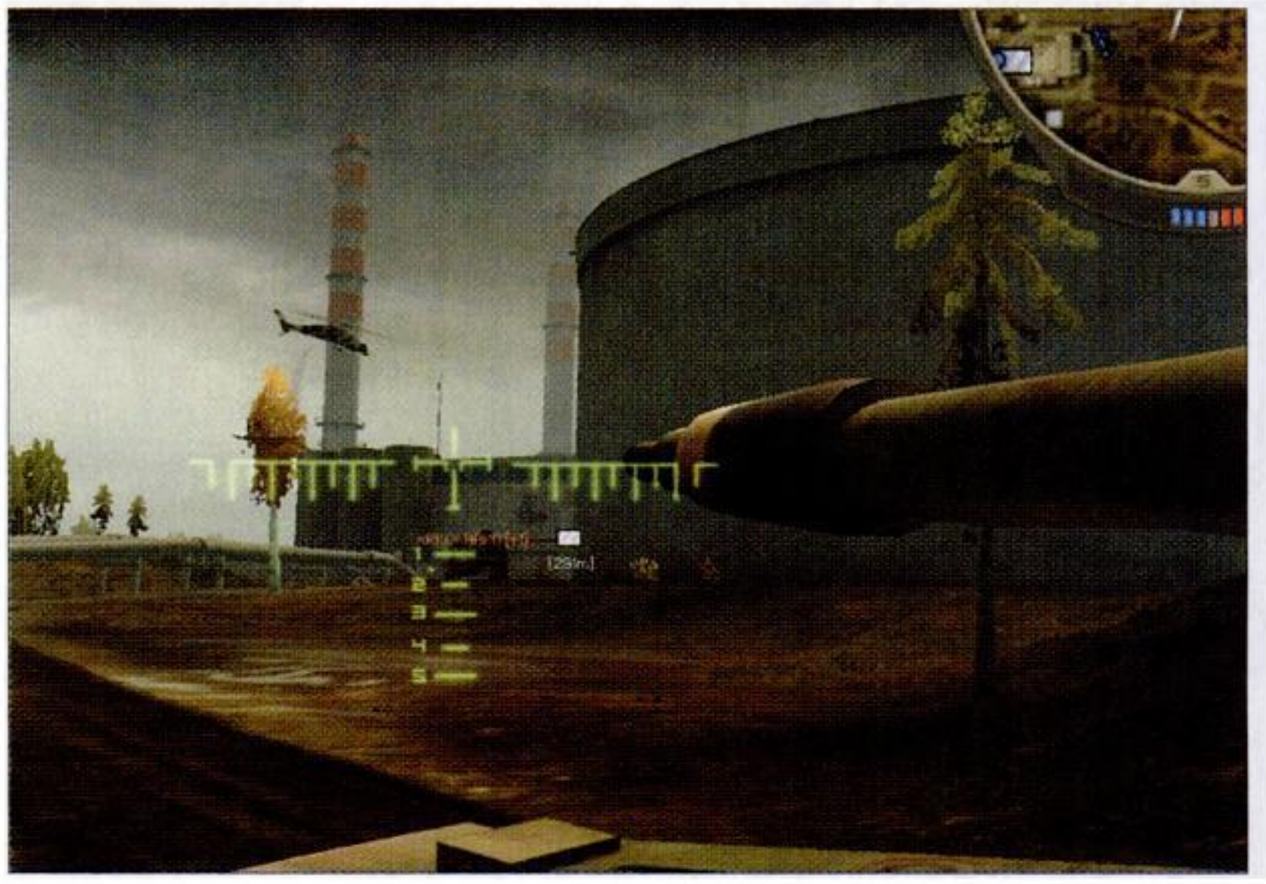
Battlefield 2

All the good of Desert Combat, plus a whole lot more



Vehicular combat in *Battlefield 2* kicks major ass. With voice communication between your squad mates, a good duo can quickly rack up a ton of kills.

The first *Battlefield* game (that's *BF:1942*, for those of you keeping count at home) only reached its defining moment when a group of intrepid modders hacked modern weapons and vehicles to replace the WW2-era weapons the game shipped with. The mod was *Desert Combat*, and it was the first large-scale multiplayer combat game featuring modern weapons.

After a forgettable sophomore attempt (*Battlefield: Vietnam*), Dice has created another game that pushes the genre forward. *Battlefield 2* manages to combine the fast pace and cohesive action of a small-squad game such as *Counter-Strike* with the grand scope and vehicular combat of the *Battlefield* titles. The secret is in the squad.

But before we can really talk about squad combat, you need to know the basics of the game. When you first join a *Battlefield 2* server and pick your team, you must select a class. Different classes have different abilities and weapons. You can carry anything from semi-automatic sniper rifles to chain-fed machine guns. There are also several classes that fulfill support roles—healing teammates, repairing vehicles, and replenishing ammo. There are dozens of vehicles sprinkled throughout most maps, including planes, tanks, boats, helicopters, and even automobiles. You'll need the vehicles to succeed, so it's crucial that you keep them repaired and stocked with munitions.

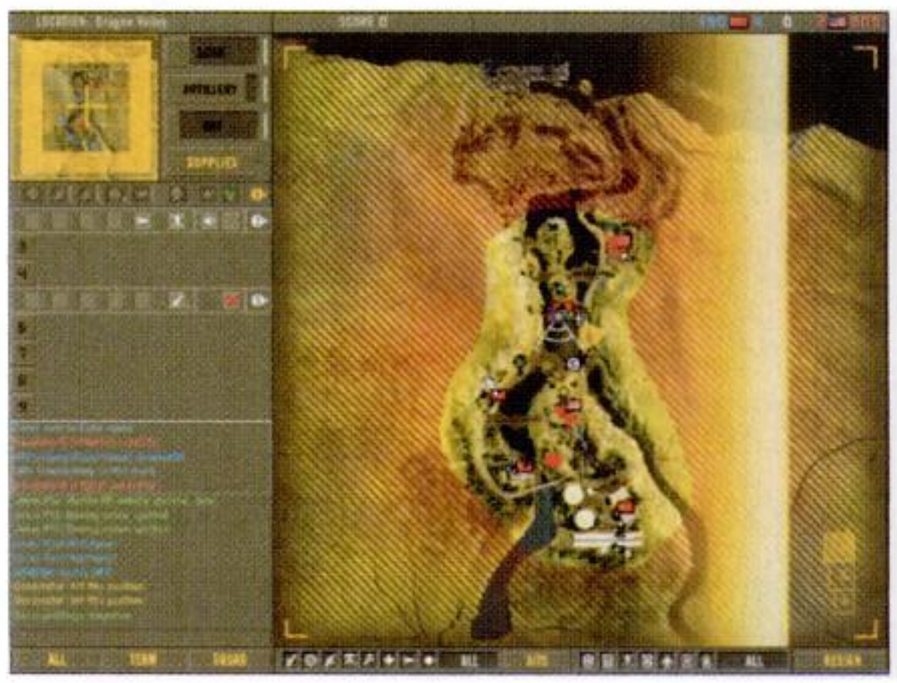
In infantry combat, you'll frequently drop prone and sight your enemy using the game's iron sights. This sniper has no idea what's coming.

The object of the game is to capture and hold all of the spawn points on the map. If you take over all the enemy spawns, while defending your spawns, you win the round. Lose the spawns, and you lose the round. The maps are huge, but unlike *BF:1942* maps, they're chock-full of choke points, which focus the battle into small, super-concentrated areas. Close-combat urban skirmishes make for brilliant fun!

By focusing the battle in those key areas—mostly urban settings—the emphasis has moved away from squad-level battles spread across five or six square miles to squad-level battles spread across a three- or four-block area.

Facilitating communication between squad members and separate squads sets *Battlefield 2* apart from its competition. Every time you connect to a *Battlefield 2* server, you have the option to join a squad. When you join a squad, you automatically get voice communication with your squad mates, and they'll show up as green blips on your radar. Most importantly, in addition to the normal spawns, you'll also be able to spawn at your squad leader's position. As long as your squad leader remains alive, you'll be able to respawn wherever he is. In large games with multiple squads, the ability to spawn next to your squad leader enhances the intense, squad-vs.-squad combat. *Battlefield 2* makes it easy to issue orders to your squad, as well. Press T and a context-sensitive menu pops up with orders that are appropriate for the target. The menus are faster and easier to use than the old keyboard shortcuts, and they provide much more useful info than in other games.

Controlling all the separate squads on your team is one all-powerful Commander. The Commander controls strategic *Battlefield* resources—artillery, aerial drones, satellite scans, and supply drops—in addition to giving orders to individual squads. The Commander can also talk to the squad leaders, giving them instructions or a warning about incoming enemy concentrations.



The Commander has access to a special map, where he can direct troops and call in artillery strikes or unmanned drones.

A painfully slow server browser and the absence of a mechanism to get you playing with your buddies keep *Battlefield 2* out of 10/KickAss territory. But *Battlefield 2*'s combination of small-scale combat and large-scale strategy is damn fun, warts and all.

—WILL SMITH

BATTLEFILED 2

SQUAD COMBAT

Game design promotes teamwork, Commander mode rocks.

KNITTING

Molasses-slow server browser, and no way to find and play with your friends.

9

MAXIMUM PC KICKASS

$50, www.battlefield2.com, ESRB: T

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The Matrix Online

This game is definitely not "the one"

The game's turn-based combat is innovative, but shortcomings make it more frustrating than fun.

In the movie *The Matrix*, Cypher asks, "Why, oh why didn't I take the blue pill?" *The Matrix Online* doesn't really drive players to ask that question, but it does resemble the trilogy in that it starts out better than it ends.

In the game you play a Redpill—someone who has chosen to "wake up" inside the artificial world of the Matrix. You begin as an agent of Zion, but over time you might choose to ally yourself with the Agents or the exiled Merovingians. The missions, leveling, and exploration are standard MMO fare, and as such are nothing special. The game world has the look and feel of the movies, from the lighting to the actual locations you'll visit. What's always been intriguing about the Matrix is the way "awakened" operatives could manipulate reality, and some of this manipulation made it to the game. Running fast, leaping far, and mastering complex fighting styles are in the game, but you won't be running across walls or dodging bullets. As for the bullet-time effect, you're able to use it for fighting, but it's nowhere near as satisfying as in the movies. The game's worst fault is its buggy, repetitive nature. The early levels are especially tedious.

One thing that *MxO* gets right is the turn-based combat system. It's unique in the history of massively multiplayer games and allows for elaborate, exciting-to-watch combat animations. Unfortunately, poor camera controls and the complete inability to fight more than one enemy at a time (though multiple enemies can attack *you*) ruin the experience. The game has potential, but there are just too many faults and missteps to hold our interest. The lack of players to populate the massive game world just makes things worse. Low population is a death knell for MMO games. Sony Online Entertainment (the makers of *EverQuest* and *Star Wars Galaxies*) acquired *The Matrix Online*, which will certainly have an impact on the game. While the SOE buyout might eventually improve the game, as it stands, we just can't recommend *The Matrix Online*.

–MIKE DE LUCIA

THE MATRIX ONLINE **5**

$30 ($15 per month), www.thematrixonline.com, ESRB: T

Grand Theft Auto: San Andreas

Finally, a *GTA* game that lives up to the hype

This summer, Carl "CJ" Johnson will kill Bill. And Francis. And Biff. And any other poor sucker unlucky enough to cross his path.

Carl "CJ" Johnson is thousands of feet in the air hurtling towards the San Fierro Bay, and he doesn't have a parachute. The only thing between him and a bone-pulverizing impact on the water is a plane filled with armed hostiles and an uncooperative pilot. Plane or water? With an unpleasant, metallic taste in his mouth, CJ thinks: "How the f* did I get here?"**

The course of events that inexorably lead him to leave the plane well before the "fasten your seat belts" light blinks on begins when CJ returns home to take back his old neighborhood from the gang of hoods that killed his mother. As he works his way up the gangsta food chain, his missions become more violent and more sinister, gradually accelerating into the free-form circus of mayhem that the *Grand Theft Auto* series is infamous for. That's all we'll say about the story—we'll let you find out on your own why CJ ditches Los Santos (Los Angeles) for San Fierro (San Francisco), keeps a low profile in the vast boonies between cities, and ends up pulling off a nail-biting casino heist in Las Venturas (Las Vegas).

***San Andreas* comes together in ways the previous two games never did, stripping out party-pooping frustrations (such as the dreadful RC 'copter mission in *Vice City*), or at least making them elective, while expanding on RPG elements. In fact, compulsively drilling through the required missions is the least satisfying and most difficult way to advance through the story. Instead, by eating regularly, working out, earning money by means fair or foul, and even wooing the ladies between missions, you'll excavate all of *San Andreas'* secrets, mini games, and storylines.**

***San Andreas* remains a humble game in many ways, with laughable, low-res textures, mildly retarded enemy AI, and a disappointing number of audio bugs. Nonetheless, it's an enormous step up from *Vice City*, and we're hooked on the stylish way it evokes criminal thrills in a vast and—the word can't be avoided—"immersive" virtual world.**

—LOGAN DECKER

GTA: SAN ANDREAS **9**

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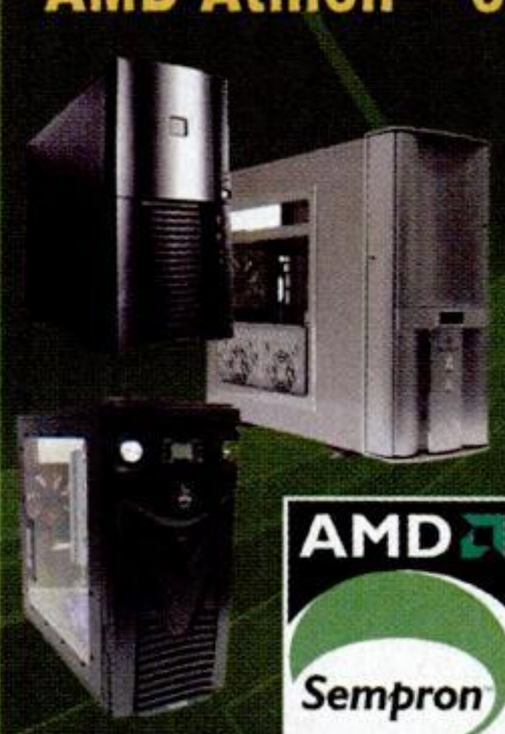

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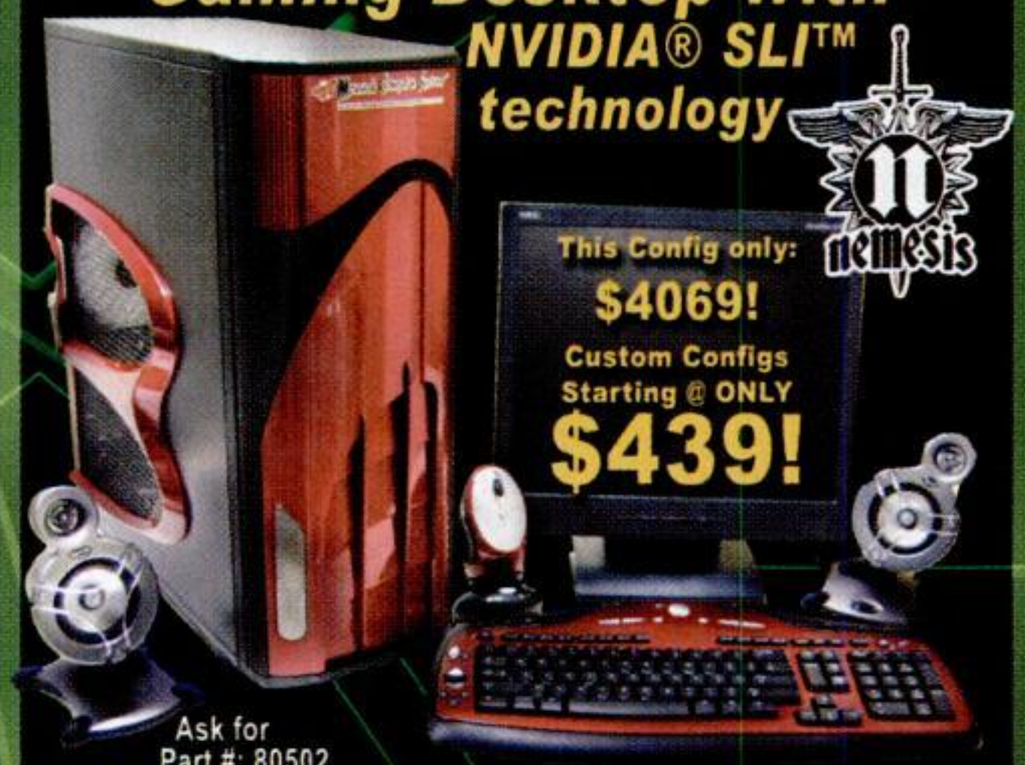

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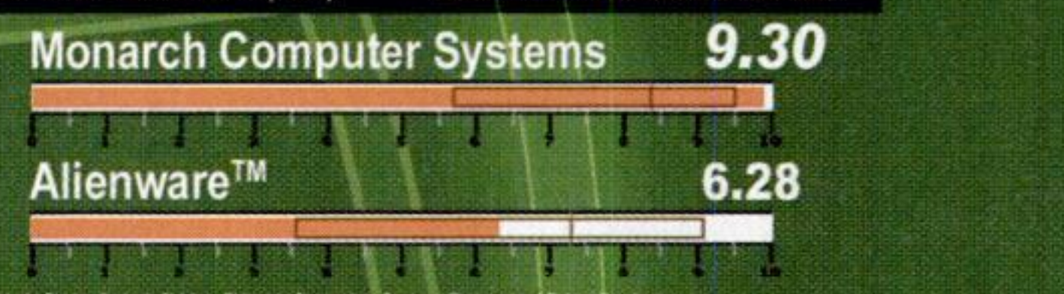

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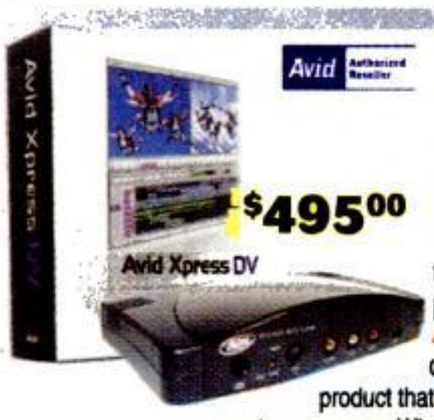

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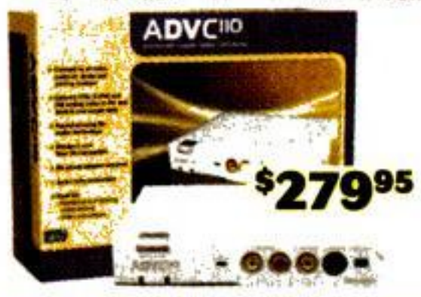

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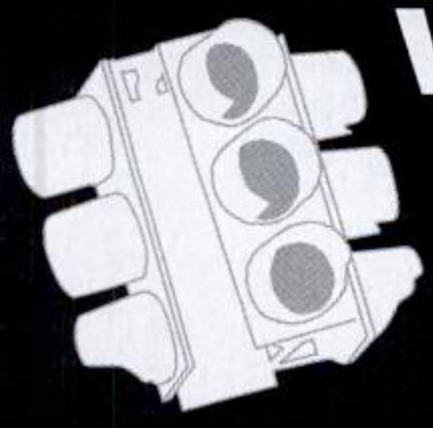

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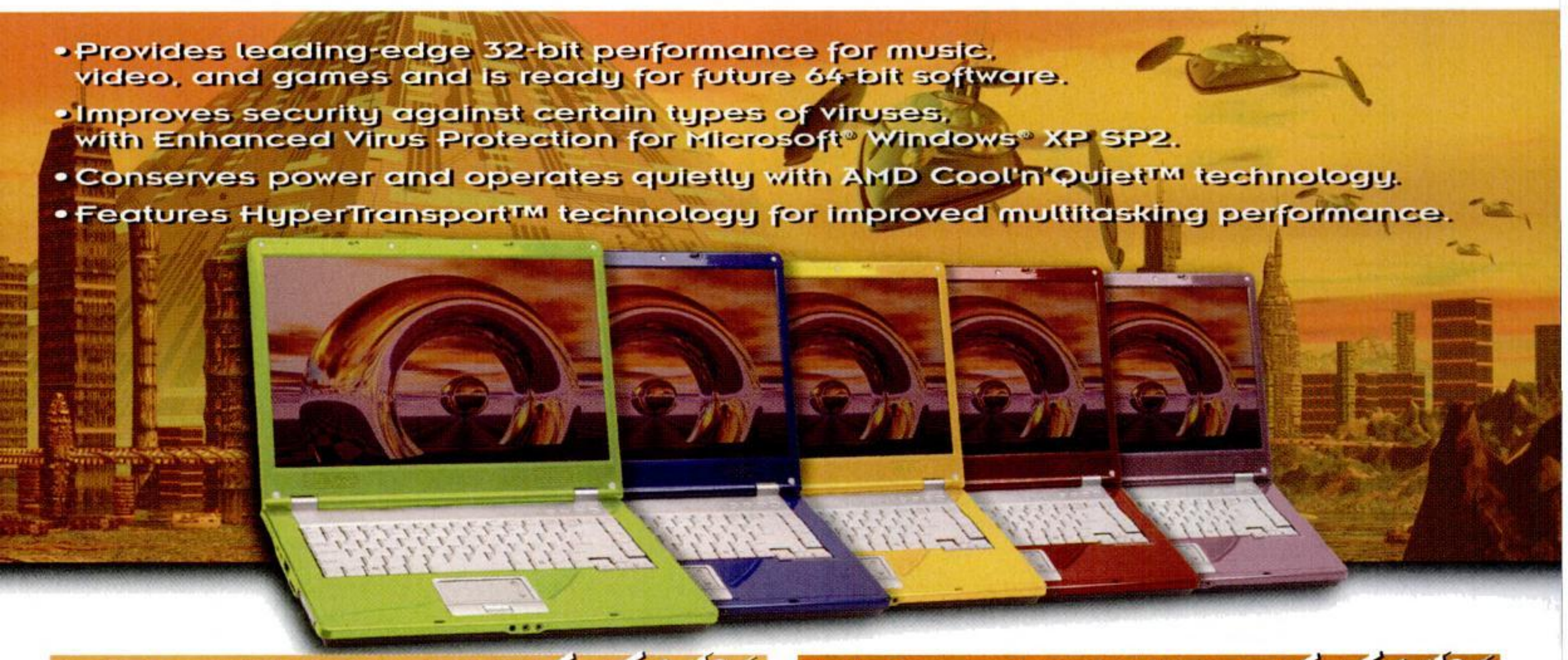
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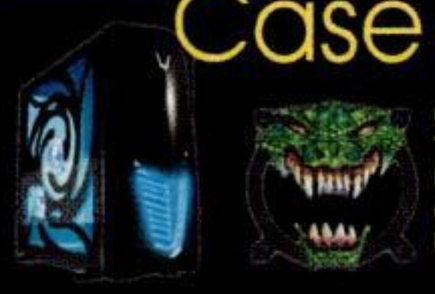

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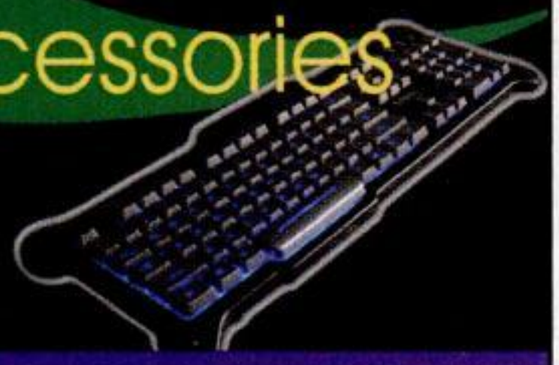

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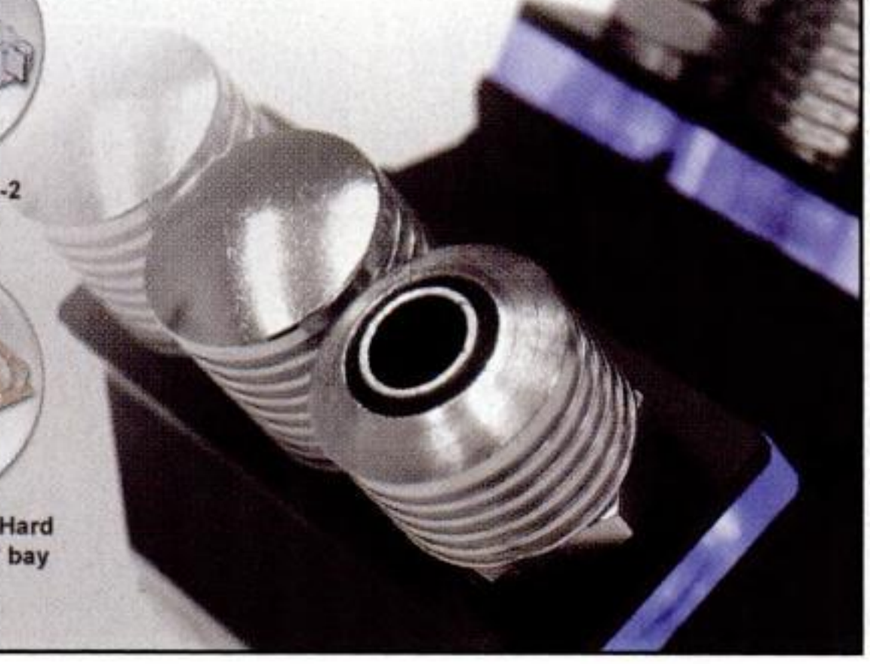

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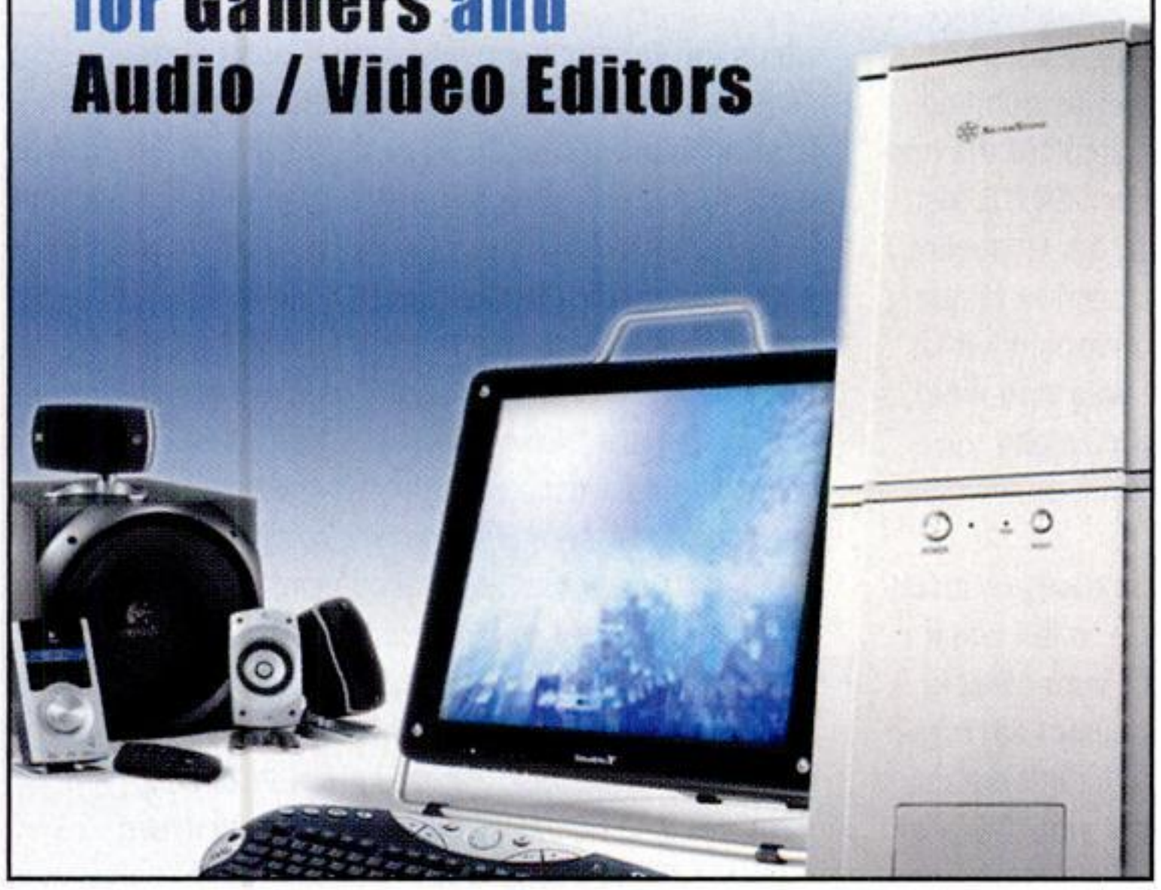

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April 2005 Review

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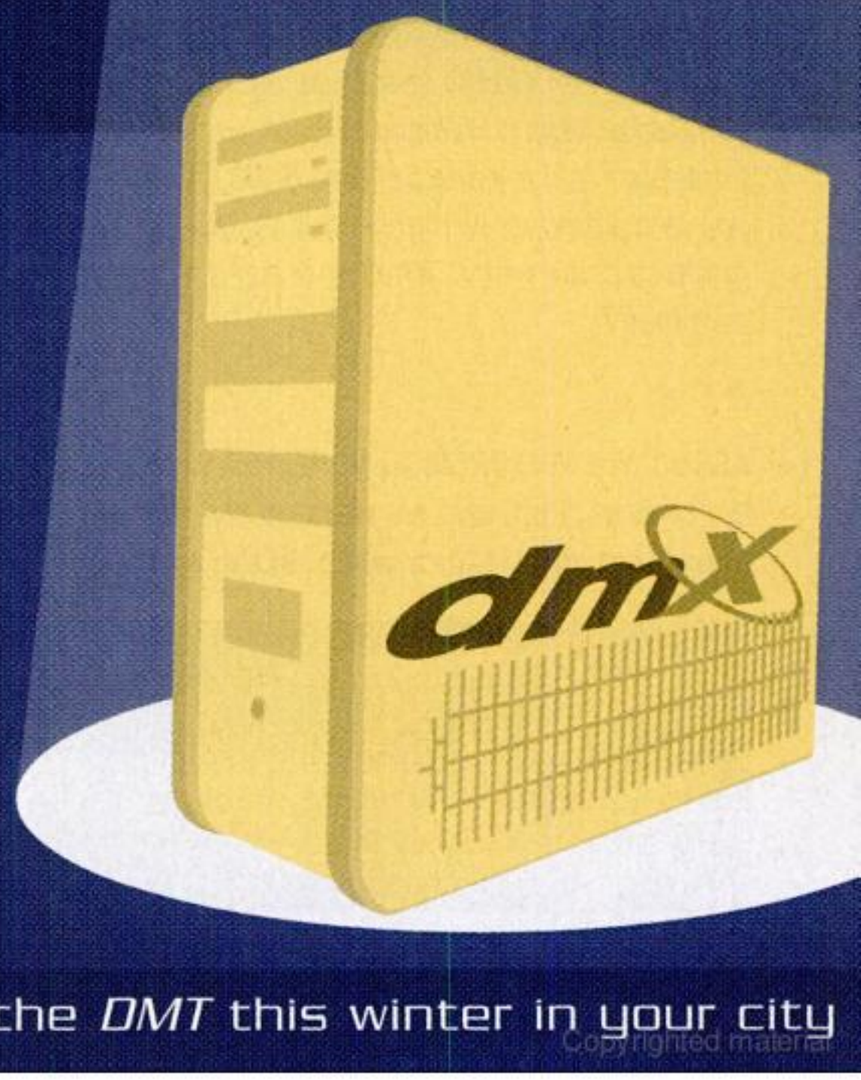

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This Month: **You ask about...**

A quick Cantonese lesson and the great price-point debate

IS THAT A RHETORICAL QUESTION?

On the cover of your July 2005 issue, you claim that all my questions about the new 64-bit version of Windows XP will be answered. But what if one of my questions is "How do you say 'Windows XP 64-Bit Edition' in Cantonese?" or "Why don't they give it a better name, like "Windows 64 All Up In Yo Shiznit?"

Some people might think these are stupid questions, but you clearly state that all questions will be answered. In light of your reputation, I've decided to give you the benefit of the doubt and assume that you forgot to include such poignant questions in the July issue, and that you plan to answer them in this one.

—Shawn

EDITOR IN CHIEF WILL SMITH RESPONDS: While we were busy determining which CPUs support the new 64-bit OS, and delving deep into the vagaries of Microsoft's upgrade scheme, we sadly overlooked the hard-hitting questions you've suggested. Your first question is easily answered: Windows XP 64-Bit Edition (check Microsoft's Chinese website if you don't believe us). The second question is more difficult. When we presented your second question to Microsoft's marketing department, their response was, "You're kidding, right?"

YOU NEED TO CHILL

*Asetek's WaterChill Power Kit rates a 9 verdict in your review (July 2005), despite the fact that you burned through two GeForce 6600 GTs while testing it. I don't know about you, but I would have suffered a serious financial setback and felt pretty bitter had I lost my **one** GeForce 6600 GT. How can you rate a product so highly after destroying two graphics cards with it, whether or not it was your own fault?*

—Phil

ASSOCIATE EDITOR JOSH NOREM RESPONDS: We hear ya, Phil, and we were on the fence about that verdict for a while. In the end, we decided not to punish Asetek's kit severely. Here's why: First, the kit delivered astounding cooling performance, achieving some of the lowest temps we've ever seen on our LGA775 test platform. Second, everything but the videocard was a snap to install. The kit's push-on fasteners were the easiest we've ever worked with, and they never leaked. Third, it was very quiet, despite the radiator's enormous size and the presence of three 12cm fans. Taken as a whole, it's the best kit we've tested.

The optional VGA cooler was tricky to install correctly because there's no way to tell when you're done ratcheting down the water block. The first time we installed it, we just kept turning the screws until the block wouldn't budge, and then the card was dead. That was 100 percent my fault. When we installed the block onto a second GT, we saw temps we thought were kind of high, so we figured it wasn't on tight enough. So I kept screwing it tighter and then, well, we all know the outcome of that.

We concluded that the VGA cooler is poorly designed, but it's just one, optional part of the whole kit. Taking away one verdict point and denying Asetek a Kick Ass award for the kit is fair and appropriate.

IT'S A JOKE, SON!

Your "Ultimate Do It Yourself Guide" (July 2005) reports that throwing your USB key in the trash isn't a secure means of disposal, because someone might find and retrieve information from it. Your alternative of flushing it down the toilet, however, not only risks the plugging of sewer pipes, but it ignores the fact that almost every wastewater-treatment plant in the country screens out solid objects. And because the volume is much smaller, the chances of someone finding the device are proportionally greater than if you threw it in the trash. Perhaps you were offering the suggestion with tongue in cheek (or somewhere else), but it's not a good idea.

—Steve Dickerson

$200 ≠ $300

I've been reading your magazine for years and I trust your judgment. So what are you doing comparing a GeForce 6600 GT with an ATI Radeon X800 XL (July

CUTCOPYPASTE

In our July 2005 issue, we said *iPod Agent* was a freeware app. It's actually shareware. You can try a fully functional version for 15 days. After that, you must register the app, which costs $15.

THIS OLD HOUSE

I disagree with reader John Meidell's recommendation that you use masonry bits or a hammer drill when boring holes in old, dense wood. The angle of cut on a masonry bit is not designed for use in wood—it will generate a huge amount of heat and could cause a fire. Hammer drills aren't a good idea, either. Hammer drills are designed to break up masonry-type material; they'll only compact wood fiber, making your job even harder. You should always use a wood bit on wood; if necessary, start with a smaller bit and then re-drill the hole larger to obtain the needed size.

—Shawn Poquette
Residential Broadband Installer
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2005)? ATI released the X700 series to compete with nVidia's 6600 series cards. They're in the same price range, and they have comparable performance. Of course the X800 XL is going to win against the GeForce 6600. Your review isn't fair to consumers.

—Ben Simpson

I just read through the July 2005 review titled "Budget Videocard Bushwhacking," and I was troubled by the assessment of the Leadtek WinFast PX6600 GT TDH Extreme. I enjoyed the review, yet the conclusion reports that "the PX6600 is a good value for people faced with a strict $200 budget." I agree that this makes an excellent card in this price range; however, I do not see how this results in a rating of 6 out of 10. Do your ratings reflect only raw performance, or do you also take price/performance ratios into account?

—Jon Beck

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS:
We received a number of letters complaining that pitting these two videocards against each other didn't amount to a fair fight. The point we're trying to make is that *Maximum PC* cares about performance much more than we care about any given price point: The X800 XL has twice the pipelines, twice the memory, and twice the memory bandwidth of the 6600 GT—and that translates into 31fps vs. 21.1fps in *Doom 3*, and 60fps vs. 30.1fps in *Far Cry*. In our book, that renders the $300 ATI board a better value than the $200 Leadtek board.

WHEREFORE ART THOU, ATHLON 64?

I enjoyed your performance notebook review "Portable Power" (July 2005), but I was surprised you didn't include any notebooks with AMD's Athlon 64 3000+ processor. HP puts this CPU in its ZV5000 line of notebooks, along with a fast graphics chip, a Toshiba hard drive, and lots of RAM—all for about a grand.

—Elliot Nightingale

SENIOR EDITOR GORDON MAH UNG RESPONDS:
We asked vendors to provide their most powerful notebooks, but we frankly didn't expect to receive so many Pentium 4 machines—that chip's a wee-bit hot to handle in a notebook. HP likely took the tack of sending us a Pentium M—aka "Centrino"—instead the Athlon 64 3000+ because the company knew it couldn't take Alienware and Dell head-on (those companies jam über-graphics chips into their notebooks). Still, HP's Centrino-powered NW8240 came across as pretty impressive.

A FIREWIRE FAN

I'm considering purchasing an external hard drive for backup purposes, and I noticed that some models—such as LaCie's Triple Interface—have a FireWire 800 interface. What's the future of this spec? Is it worthwhile to get a PC add-on card for FireWire 800? Will this interface eventually become mainstream?

—Peter Pinteric

ASSOCIATE EDITOR JOSH NOREM RESPONDS:
Don't bother, Peter. FireWire 800 is barely available today, and it's unlikely to be popular on the PC for some time, if ever. Unlike FireWire 400 and USB 2.0, you won't find this tech built into today's mobos. That means you'll need to buy an add-in card, and that's just one of the strikes against it. None of the external drives we've tested (including LaCie's FireWire 800-ready Bigger Disk) come close to saturating the slower, cheaper FireWire 400 bus, so why pay for more bandwidth than the drive can use? There's nothing inherently *bad* about FireWire 800; but in our opinion, the technology doesn't offer enough benefits over either FireWire 400 or USB 2.0.

FROM RUSSIA, WITH LOVE

I've discovered the website Allofmp3.com, which delivers everything you could ever want from a music-downloading site. It has more than 300,000 tracks, and they all cost about $0.10 per track. Now you may be a little skeptical given the site is hosted in Russia, but it accepts Pay Pal, so what more could you ask for? What's more, there is no type of copy protection with the music, so you can do whatever the hell you want with it.

—Mitchell Paton

EXECUTIVE EDITOR MICHAEL BROWN RESPONDS:
Well, Mitchell, you can also buy narcotics such as Vicodin over the Internet without a doctor's prescription. But that doesn't make it legal. We're not experts on international copyright law, but we suspect that Allofmp3.com runs afoul of it. This disclosure on the site, under the heading "Is it legal to download music from site Allofmp3.com?" makes us doubly suspicious. It states that "Allofmp3.com's Administration does not keep up with the laws of different countries and is not responsible for the actions of non-Russian users."

In other words, if the RIAA's storm troopers come knocking on your door, they're unlikely to be sympathetic to your defense of "But they take Pay Pal!" MPC

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COMING NEXT MONTH IN MAXIMUM PC'S JULIENNED & PARBOILED OCTOBER ISSUE

NEXT-GEN WINDOWS

Microsoft's long-delayed but highly anticipated next version of Windows—code-named Longhorn—is running in the Lab! Next month, we'll give you the nickel tour, explain how it works, and introduce you to all the new features. Then, we'll answer the $10,000 question: Should you plan on upgrading?

RAM BUYERS GUIDE

Explore the mystical world of memory with our all-inclusive buyers guide. Our experts will tell you all you need to know about our little stick friends, including the differences between expensive RAM and cheap RAM, what type of memory is right for your rig, and how much memory you really need.

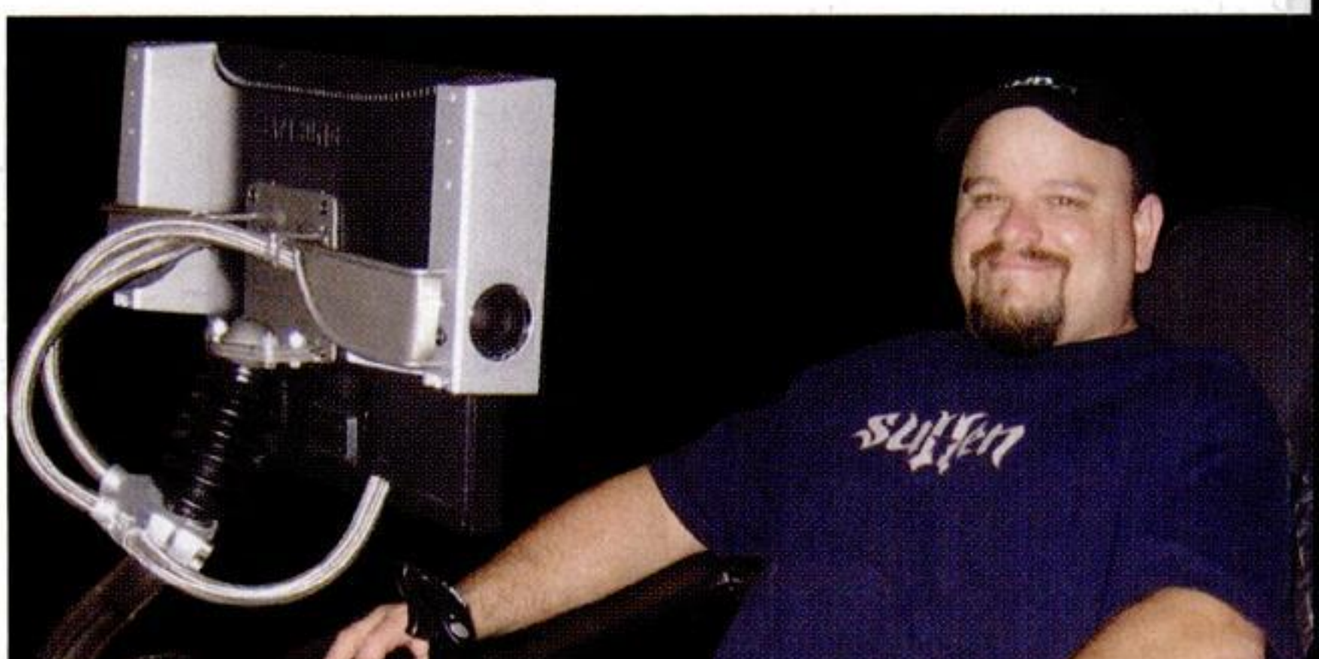
LEAN MACHINE 2005

Yes, it's lean, but boy oh boy is it mean! This year's budget box proves you don't have to rob a bank or sell a kidney on eBay to afford a super-fast PC!

STEVE WRIGHT'S

ZX-6R PC

It all started with a single random, lucky bit of scrap metal," says Steve Wright, who got the idea for his PC mod when a neighbor tossed out the damaged frame of a 2003 Kawasaki ZX-6R motorcycle. Actually, at first he was simply going to turn the scrap into a cool-looking chair, but the online-gaming enthusiast soon recognized its greater potential. Some six months later, Wright—a long-time tinkerer and full-time auto mechanic—had that frame and a whole lot of other random auto parts and miscellaneous odds and ends assembled into the ultimate gaming station, replete with a comfy, reclining chair, a flexible monitor mount, a built-in sound system, and a variety of game controllers within easy reach.

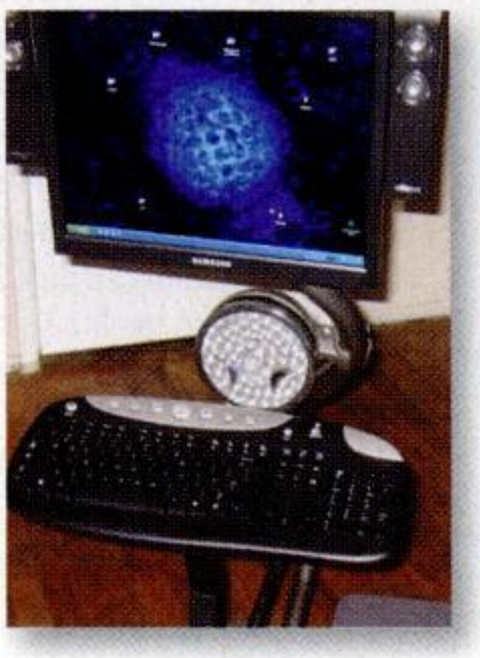


Behind the Honda motorcycle seat that serves as a backrest is a thumping subwoofer, part of the rig's Creative I-Trigue L3500 speaker set. The sub is housed in a particle board enclosure built specifically to fit between the frame rails. The amplifier and related electronics are mounted in the seat-back above the embedded CD-ROM drive.

As you can see above, the ZX-6R's seat frame provides ample room for a PC. Air comes in through the front and then exits out the back near the subwoofer. "The hardest part of the whole build was pulling all the wires for the monitor and speakers through the tube all the way from the foot rest up through the manifold and stainless tubes.... It wasn't fun!," says Wright.

"What started the idea of making the ZX-6R frame into a case mod was the simple fact that it had a large square opening in the front of it," says Wright; "I got to looking at it and said to myself 'Hmmm..... that looks like a PC case fan would fit perfectly in there.'"

That fan takes in the air to cool the components in the rig's seat.



SPECS

CPU	AMD XP-2600 Barton
MOBO	ECS N2U400 nForce2
VIDEOCARD	ATI Radeon 9700 Pro
MONITOR	Samsung 710N 17-inch LCD
GAME CONTROLLERS	Saitek R440 force feedback wheel, Logitech Extreme 3D joystick, Nostromo Speedpad n52

If you have a contender for Rig of the Month, e-mail **rig@maximumpc.com** with high-res digital pics and a 300-word write-up.

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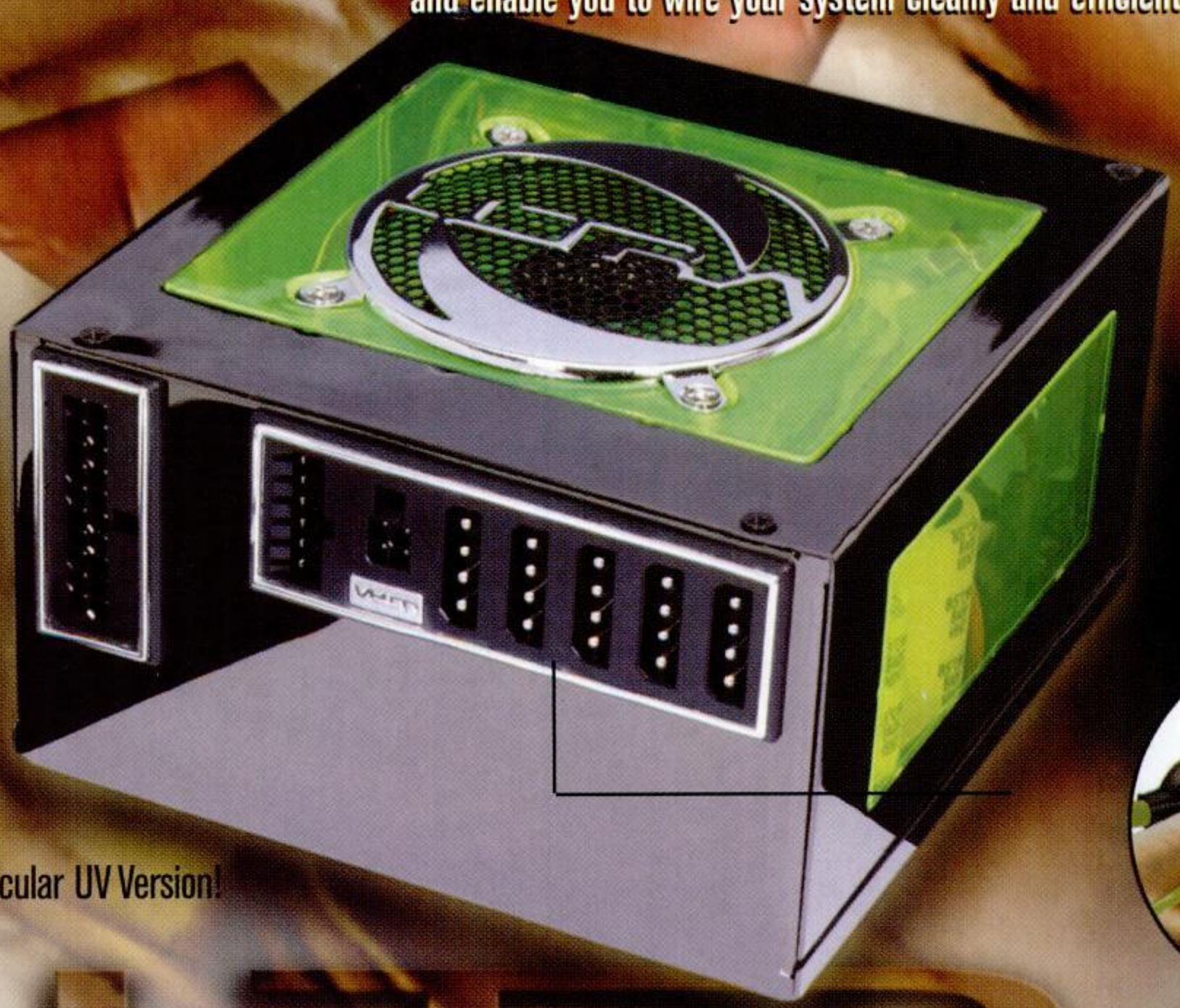

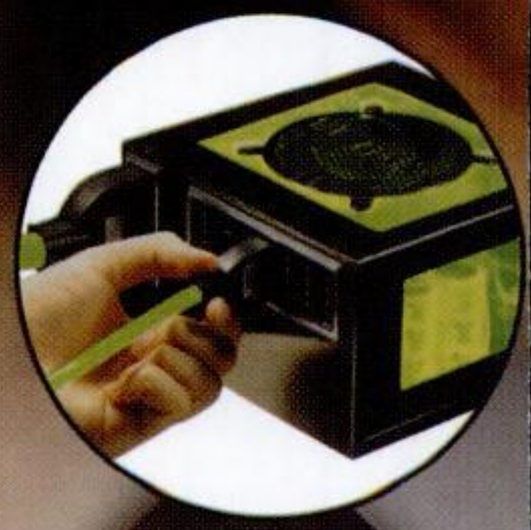

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